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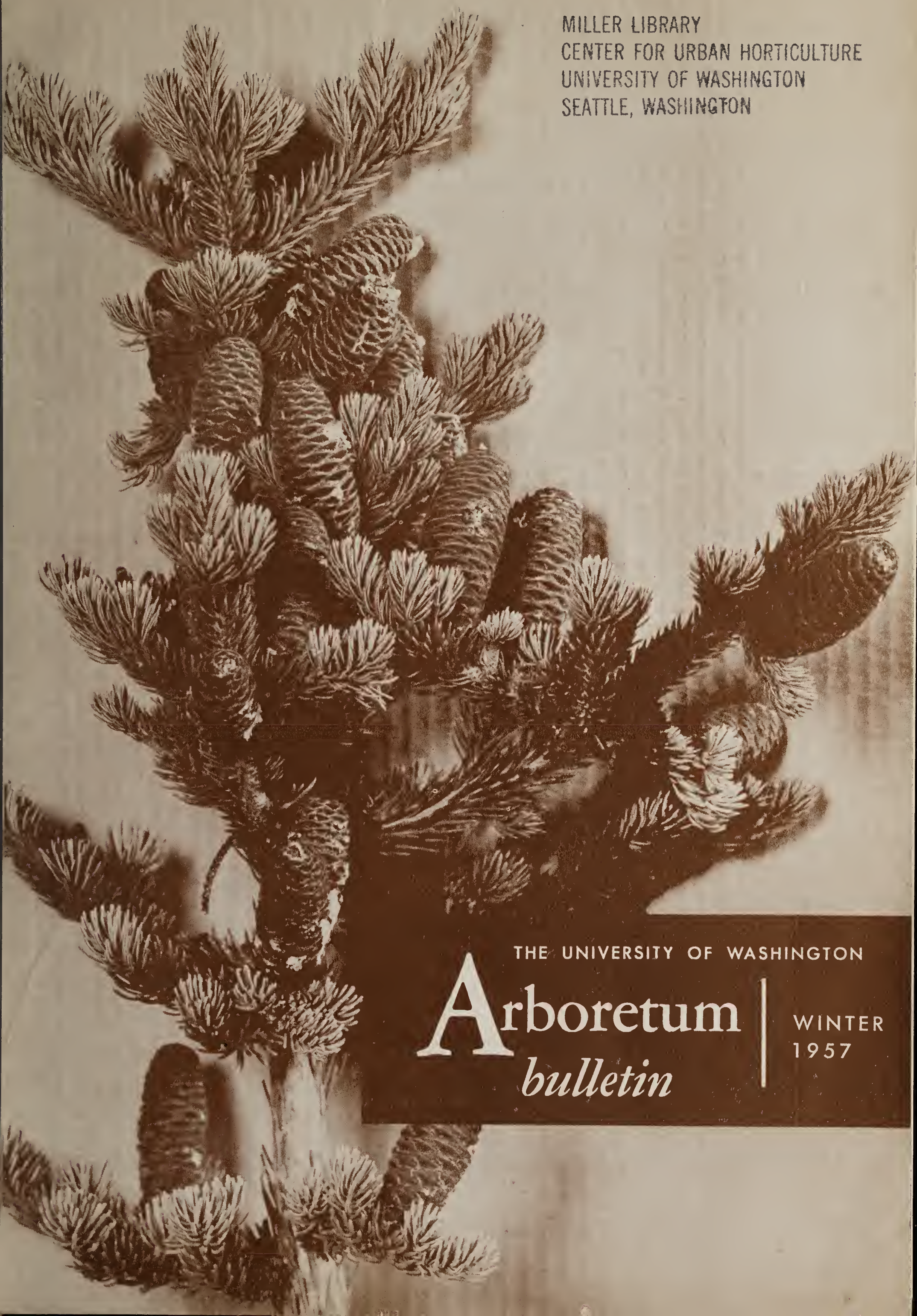

THE UNIVERSITY OF WASHINGTON

Arboretum *bulletin*

WINTER
1957

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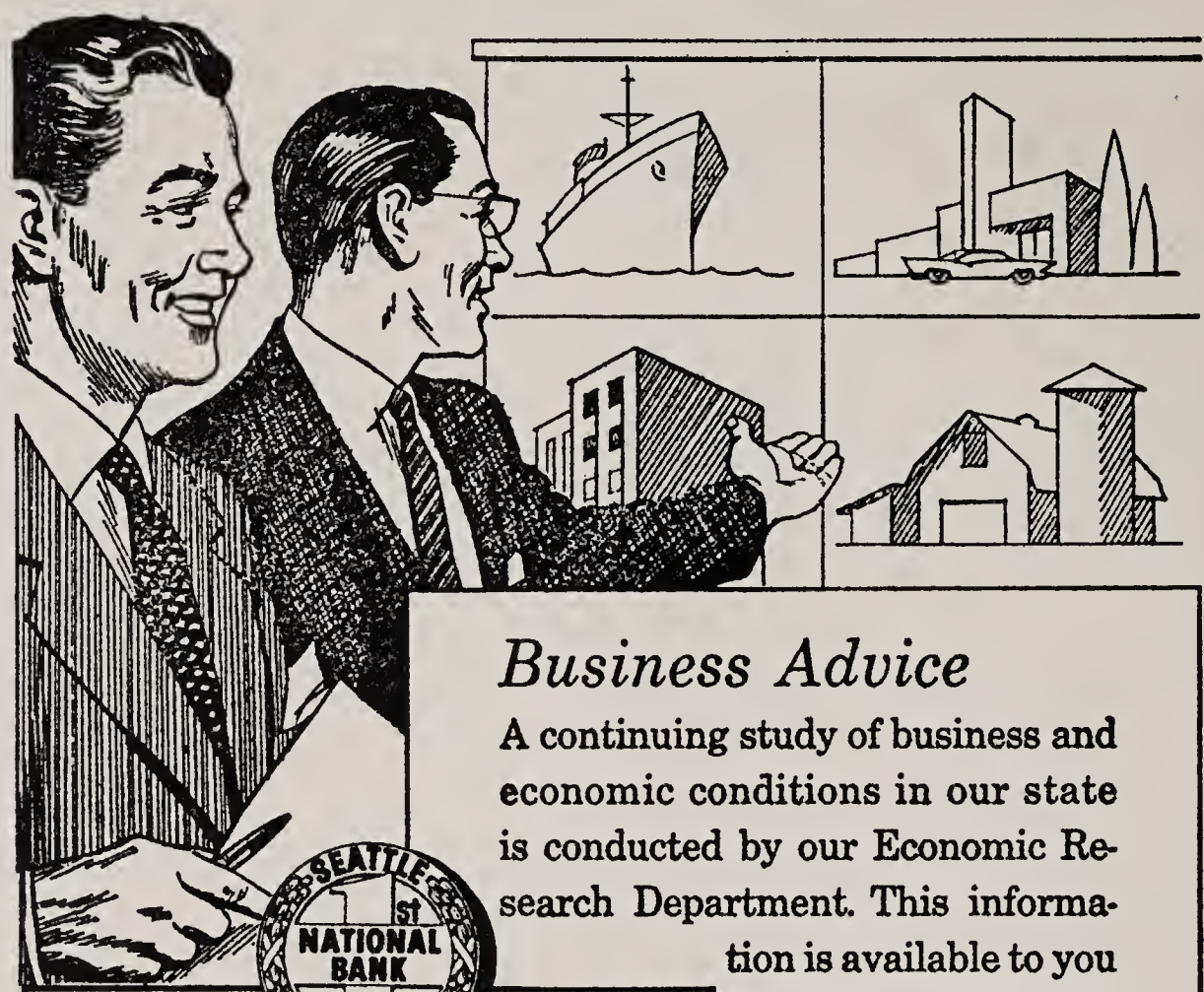

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THE UNIVERSITY OF WASHINGTON

Arboretum bulletin

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COVER: Cone of Alpine Fir
(Abies lasiocarpa)

The Hardiness of Rhododendron Hybrids

Donald K. McClure*

The severe winter freeze of 1955 has proved to have a two-fold effect upon plantings of rhododendrons in the Puget Sound area. The sequence of extreme cold and damaging wind immediately following a mild, early autumn, in which plant growth proceeded unchecked, eliminated many favorite rhododendrons from our gardens and seriously damaged many others believed to be reliable. A secondary result was the establishing in the favor of many gardeners of rhododendron hybrids capable of withstanding the very worst imaginable conditions to which our usually favorable climate could subject them. Whether such a basis of judging these most desirable plants is a correct one is not the purpose of these notes. Rather, this represents an effort to mention those rhododendron hybrids which either resisted the cold successfully or suffered sufficiently small damage to permit recovery within a reasonable period.

The approach will be to list these plants in general basic color groups and to differentiate between those which came through undamaged and those to which damage was limited to a repairable degree. An indication of approximate size and habit will be attempted. Plants which basically rely upon hardiness alone, that is, those which have few superior qualities of bloom or foliage to recommend them, will be disregarded. It is, of course, to be understood that any commentary of this sort always represents a synopsis of individual experience and personal preference.

Undoubtedly the most spectacular rhododendrons are those whose flowers range among the reds. Generally speaking, these are tender to the extent that their blood strains are strong in *R. Griersonianum, R. arboreum* and *R. Thomsonii.* Hardiness, on the contrary, probably results from strong infusion of *R. catawbiense.* Of the many fine reds which have favored our gardens, it is extremely heartening to note that "Britannia" and "Hon. Jean Marie Montague," both superb plants with bright crimson flowers, fared very well. Damage in these plants was largely limited to loss of flower buds and, at the most, partial defoliation. Another old friend, "Vulcan," despite its *Griersonianum* parentage, came through in the writer's garden completely untouched and bloomed well the following year. The old reliable "Mars," a dark true red, also resisted the adverse circumstances without damage. All of these plants are in the medium to tall growing category and are of good growth habit. Among the semi-dwarf reds, only "Hummingbird," with large drooping crimson bells, was noted by the writer as having been especially resistant to the cold.

Other weather-resistant reds of varying degrees of merit are "John Waterer," a medium to tall carmine; "Michael Waterer," a bright crimson; "Princess Elizabeth," a tall, rather leggy deep crimson; "Rubens," a medium low growing sprawler with flowers like a reduced "Mars;" "Bagshot Ruby," "Trilby," and the old faithful "Doncaster." "Essex Scarlet" and "Pygmalion" survived adequately, although their growth habits make recommendation questionable. A bright new star upon the red rhododendron horizon was found in "Spitfire," which, even in small plants, survived well.

Numbered among the mainstay plants in our gardens are the pink rhododendron hybrids. While considerable unlooked-for tenderness was experienced in many of these, nevertheless, an adequate number came through without damage. In this general group, it may be said that weakness comes from inclusion in the blood line of substantial *Griersonianum* or *Griffithianum* parentage. Durability is found in the progeny of *R.*

*Mr. McClure was President of the Seattle Chapter, American Rhododendron Society, 1956-1957.

catawbiense, R. Fortunei, and amongst the smaller plants, of *R. Williamsianum.*

Particular note should be made of the fine qualities of the small offspring of *R. Williamsianum.* For the average garden with its limitations of scale and space they are indispensable and their demonstrated characteristics of hardiness make them among the most dependable of material. "Bow Bells" is so well known as to require little description. Suffice to say that it is a medium dwarf pink of great floriferousness and equally great durability. "Temple Belle," of similar size but more twiggy and spreading in habit, behaved very well. Its color is more of a lilac pink than the preceding plant, but it definitely merits inclusion in the garden. "Treasure," a dwarf with deep pink bells, is reported to have survived very well and, while not of as demonstrated a hardiness as the preceding, should by all means be included. "Moonstone," which in its clonal forms is best known as a pale yellow dwarf, is recommended as pertaining to this general group of plants and also because many seedlings of this cross are pink and are superb hardy low growing plants. "Arthur J. Ivens" and "Dormouse" are also desirable plants of this description.

Generally speaking, plants of the "Pink Pearl" persuasion demonstrated reasonable hardiness. "Pink Pearl" itself, tall growing and leggy, in most instances either was undamaged or recovered in one season. "Betty Wormald," of better habit and flowers, proved tender as to flower buds and suffered some leaf damage, but, except in isolated cases, survived. "Marinus Koster," virtually identical to the last, performed similarly. "Antoon Van Welie," "Jan Dekens" and "Souvenir of Dr. S. Endtz" all behaved well.

Typical of the excellent performance of the progeny of *R. Fortunei* is the fine record of "Naomi" and its forms. These plants, medium to tall in size, with flowers from soft rose pink to rose crimson, scented and with yellowish throats, survived in exceptional manner. Another *Fortunei* hybrid of good behavior is "Fortorb." Still another is the tall growing "Luscombei."

Other old favorites among the pinks fared diversely. "Mme. Chauvin," of medium height, rose pink with deep blotch, did well. So did "Mrs. Philip Martineau," the same color with a yellow blotch. "Azor," however, a tall growing apricot pink, suffered considerably in some gardens. The very beautiful "Mrs. Donald Graham" did not prove hardy, nor did "Mrs. G. W. Leak." "Mrs. Furnival," a better plant than the latter, proved somewhat cold-resistant.

While many fine yellow rhododendron hybrids failed to survive the cold weather, a reasonable representation of good plants proved their worth. "Goldsworth Yellow," of medium growth, good habit and fair color, is of iron hardiness. "Broughtonii Aureum" is an azaleodendron and hardy, however, little else may be said for it. "Goldfort," a strong growing creamy yellow, proved very hardy. "Adriaan Koster," compact in growth, with flowers cream with a yellow center, and "Letty Edwards," yellow with red throat, proved similarly good. "Unique," "Diane," "Carita," "Souvenir of W. C. Slocock" and "Butterfly" seem slightly less hardy. "Elspeth," a small compact plant with scarlet buds fading to apricot and then yellow, suffered damage, but has apparently recovered well.

In the white rhododendron hybrids, disappointment was experienced in the case of "Loderi" and its forms. Loss of buds and leaves was general, although good recovery has been made in many cases. "Beauty of Littleworth," "Queen of the May" and "Albatross" behaved similarly. "Loders' White," of good growth and habit, defoliated considerably but lost few flower buds. It has apparently recovered well and seems to hold to its distinction of being the best of the whites. "Gomer Waterer," a tall blush white, proved very hardy, as did "Mother of Pearl." "Van Nes Sensation," of pale lavender white, came through well. Of the blotched whites, "Mrs. Charles Pearson" and "Sappho," dark,

"Mrs. A. T. de la Mare," green, and "Mrs. P. D. Williams," brown, suffered little damage. "Helene Schiffner," with its tight trusses of small flowers, is, as was known, very hardy.

No color class of rhododendron hybrids survived better than did the purples. With the exception of hybrids of *R. Augustinii* and some of the offspring of the dwarf Lapponicums all proved garden plants of hardy constitution, if uncompromising in color. Special mention should be made of "Purple Splendour," "Blue Ensign," "Blue Peter," "Susan," and "Fastuosum plenum" all of which are good plants, where usable, and all are iron hardy.

Hardy Rhododendron Hybrids In The Arboretum

J. A. Witt*

ANY list of the "best" or the "hardiest" plants depends on several factors. Primarily such a list reflects the author's acquaintance with the material; the conditions under which it has been grown, and finally the various likes and dislikes that the author has. In the following I have attempted to select what I consider as the best of the hardy rhododendron hybrids that survived the drying winds and freezing temperatures of November, 1955. Keep in mind, when reading these choices, that the Arboretum's collection of species was much more complete than its collection of the newer hybrids, that the location of the plants varied from completely sheltered to completely exposed, and finally that the plants I choose as the best may well not be what you would choose.

Many fine plants were damaged in varying degrees by that cold November; some had minor leaf burning, some were killed outright, and there were all stages between. For the purpose of choosing the best of the hardy rhododendrons, we have eliminated all those which suffered more than any superficial injury. Even if they had only minor damage to the new shoots and buds, I have eliminated them and hence hope that the following hybrids are "iron clad," at least for our area. We will start our list with the low growing types, then work towards those of taller stature.

Pre-eminent among the smaller hybrids and perhaps among all the hardy survivors, is Rhododendron "Bow Bells." Our plants were on an open south slope which was planted with members of the *Thomsonii* series. With few exceptions this bank was as brown and sere as if it had been blasted with a flame, yet here was our "Bow Bells," a green pool in the midst of all the desolation. Not only did it refuse to lose a leaf to the freeze, but it flowered as freely in the spring of 1956 as it ever did. "Arthur J. Ivens," which is very similar in appearance to "Bow Bells," although somewhat taller growing, was likewise undamaged and flowered well the next spring. There are a number of other hybrids with *R. Williamsianum* in their background that were unscathed, but most of our plants were protected by frames or a lath house and so can't be compared with those outside.

The old variety "Cunningham's Sulphur" with its pale yellow flowers was not hurt in the least and is, in my opinion, one of the best of the low yellows, and especially good for a difficult situation. A close relative is the white flowered "Boule de Neige" which also was unhurt and, while not really first-class, must nevertheless rate high for its smaller size and good flowers.

Moving now from the low to medium-sized plants, we find that the number of hybrids undamaged by the freeze is greatly increased and it is much more difficult to choose the "best." However, on casting my mind back to the spring of 1956, I find that the performance of the so-called Slocock hybrids stand out, and of these I choose "Unique" as the top. "Unique" did suffer some bud and

*Assistant Director, University of Washington Arboretum.

leaf damage, but it was very moderate, even when the plants were in a very exposed location. Others of this group might as well have been chosen, such as "Souvenir of W. C. Slocock," "Mrs. W. C. Slocock," "Butterfly," which I like very much for its flower but not its habit, or "Goldsworth Yellow." Any of these has superior flowers and very attractive foliage but none is better than "Unique."

Rhododendron "Praecox" was a joy to behold that bleak spring of 1956, when it covered itself with its bright rosy-red flowers. The habit of this little plant may be just slightly stiff, but it more than makes up for it with its deep shining green leaves. "Praecox" is definitely first class.

For those who like the dramatic effects of the blues and purples there are two outstanding plants in "Blue Peter," and "Purple Splendour." Both flowered well in 1956, as was evidenced by the number of entries of these two hybrids in the 1956 Seattle Rhododendron Show.

Among the best of the red-flowered hybrids I count "Borde Hill" with a very dark red truss, and the old favorite, "Britannia," with its brighter red flowers. Neither of these showed other than minor damage, and both behaved well in 1956. Among the hardy pinks I would choose "Corona" for a coral pink and "Goldsworth Pink" for a clear pink —although it may be that our plant of the latter is not true to name. I believe it has been called "Mrs. Mary Ashley" by some authorities.

"Dr. Stocker" appeared to be the best of the whites in the medium-size class, and I think should be rated among the best of the whole group for its handsome ivory-white flowers.

Again we find among the larger rhododendron hybrids such a number of good hardy plants that any choice of the best is very difficult. At the risk of offending any number of rhododendron fanciers, I am not going to include "Pink Pearl" nor "Cynthia," but start with a hybrid that needs to be better known. Rhododendron "Luscombei," Leonardslee var., is a most surprisingly hardy plant considering that it is a hybrid of *R. Thomsonii.* It has the foliage and the flower shape of *R. Thomsonii,* but softened by the influence of its other parent, *R. Fortunei.* We have a number of seedlings of Luscombei, most of which are good, but none compare in flower color and truss size to the Leonardslee variety.

The lovely soft white-flowered "Mrs. Lindsay Smith" was among the best of the rhododendrons flowering in 1956. Perhaps if the habit of the plant was somewhat less leggy it would rate higher among rhododendron fanciers than it does at present, for the large rugose leaf and handsome truss makes it outstanding.

The Loderi family of rhododendrons behaved in a most puzzling manner. Large plants of "King George" were blasted within an inch of their lives, yet "Pink Diamond" planted only a few yards away suffered slight leaf burn only. I feel, then, that I am justified in including "Pink Diamond" among the hardier, even though some of its blood brothers were killed outright.

Of more than passing interest was the remarkable performance of a group of Loderi seedlings. These plants, some 15 years old, were completely unharmed and flowered beautifully the next spring. Of these plants certain clones have been selected, and one named to date. These I am sure will give us some of our best hardy hybrids.

Another of the "best" is one which has a difficult color, but whose other merits are undeniable. This is "Fastusom Plenum," an old *R. ponticum* hybrid with immense numbers of mauve-colored semi-double flowers. While I am not an admirer of mauve flowers, and even less of double flowers, I must admit this plant to my list after its brilliant showing in 1956.

One last choice, or rather choices, would be the so-called Dexter Fortunei hybrids. Singly I don't believe any one of the many clones we are growing would stand out, but

taken as a whole these plants proved their worth that November. In case you are not familiar with their history, a brief note might be in order. Mr. C. O. Dexter of Cape Cod, Mass., became interested in hybridizing rhododendrons for use in his more severe climate, and having considerable resources behind him, bred literally hundreds of thousands of plants. In 1938 and 1940 he sent the Arboretum a large number for trial and the plants referred to above are from these lots. Very few of his plants have been offered commercially, and as far as I know, none of ours. They are of considerable interest, particularly in the east where their undoubted hardiness compensates for their lack in some other characters.

These are what seem to me to be the best of the hardy hybrids, and a garden full of them would, I feel confident, compare favorably with almost any other choices that could be made.

Some Results of the November, 1955, Freeze

Charles L. Edmunds*

THE 1955 freeze is still a good topic of conversation today, two years later. It was with a great deal of interest that the following chart was compiled. The material presented has come from several nurseries and gardens in the Tacoma area. All of the information coming through the members of the Tacoma Rhododendron Society.

Most of the growers and gardeners seem very reluctant to believe the ratings can be applied to this worst of freezes and should be forgotten as a freak. However, it seems to me that the rating came up with flying colors, with just a little interpreting being necessary. The main idea to keep before us is that condition, position, general health of the plants can vary in any one given garden. The overall picture will still favor the hardiness ratings to a great extent. We would not be gardeners at all if we were not able to notice the peculiarities of nature and learn by noting the results.

Each sign (x) means a complete report on this variety from one garden or nursery.

*Nurseryman and member of the Tacoma Chapter, American Rhododendron Society.

Name	Hardiness	Little or No Damage	Up to 50% Defoliated	Over 50% Defoliated	Killed
A. Bedford	H3	xxx			x
Albatross	H3	xx			
Alice	H3	xx			xx
Amy	H3	xx			xxx
Annie E. Endtz	H3	x	x		
Antoon van Welie	H3	x	xx		
Arthur J. Ivens	H2	xxx			
Arthur Osborn	H3				xxx
Azor	H4	x	x	x	xxxx
Beau Brummell	H3				xx
Beauty of Littleworth	H3	xxx			xx
Betty Wormald	H3	xxx	x		x
Blue Diamond	H3	xx	xx	x	xx
Blue Tit	H3	xxx	x		x
Bonito	H3	x	x		
Blue Peter	H2		x	x	x
Bowbells	H3	xxxx	x		xx
Britannia	H3	xxx	xx	xx	x
Carita	H3	xx			x
Carmen	H4	xx			xx
C. B. Van Nes	H4		x	xx	xx

Name	Hardiness	Little or No Damage	Up to 50% Defoliated	Over 50% Defoliated	Killed
Cilpinense	H4				xxx
Cornish Cross	H4				xxx
Corona	H3				xx
Countess of Derby (Eureka Maid)	H3	xx			xx
Cynthia	H2	xxxx	x		xx
David	H3		xx	x	xxx
Dawn's Delight	H3		xx	x	xx
Diane	H3			x	x
Diva	H4			x	x
Earl of Athlone	H4		x	x	xxxx
Elizabeth	H4	x			xx
Fabia	H4		x	x	xx
Faggetter's Favorite	H3		x		xx
F. C. Puddle	H4				xxx
Francis Hanger	H4				xx
Fusilier	H4				xxxx
Glowing Embers	H3			x	xxx
Goldsworth Yellow	H2	xxxx			
Grosclaude	H3	x			xxx
Hawk	H3		x	x	x
Humming Bird	H4			x	xx
Impi	H3		x		xx
J. G. Millais	H4			x	xx
Jan Dekens	H3	xx		xx	
J. H. Van Nes	H4		x		xxx
Jock	H3	xx			x
King of Shrubs	H4		x	x	x
Ladybird	H4				x
Lady Bligh	H3	x	x	x	
Lady Chamberlain	H4			x	xx
Lady Rosebery	H4			x	xx
Langley Park	H3		x	x	x
Loderi King George	H4	x	x	xxx	
Loderi Pink Diamond	H4	x			xx
Loderi Superlative	H4				xx
Loderi Venus	H4	x		xx	x
Loderi White Diamond	H4			x	x
Loder's White	H4			x	
Margaret Dunn	H3		x	xx	x
Marinus Koster	H3	x		xx	x
Mars	H2	xxx	x		
May Day	H3				xxxx
Moonstone	H3		xx	x	
Mother of Pearl	H4			x	xxx
Mrs. A. T. de la Mare	H3	x			x
Mrs. C. B. Van Nes	H4			x	xx
Mrs. Chas. Pearson	H3	xxx			
Mrs. E. C. Stirling	H3	xx			
Mrs. Furnival	H3	x	x		
Mrs. G. W. Leak	H4		xx		xx
Mrs. Lionel de Rothschild	H3	x			x
Mrs. Mary Ashley	H3	x			x
Naomi	H2	xx	x	x	xx
Naomi Early Dawn	H2	x			
Nereid	H3				xx

(Continued on Page 162)

THIS ROAD
IS CLOSED DAILY
FROM 11 P.M. TO 5 A.M.

Oregon Ash

Fraxinus oregona

C. Frank Brockman *

ALTHOUGH not uncommon in the Pacific Northwest the Oregon ash often passes unnoticed due to the dominance of coniferous evergreen trees characteristic of the forests of this region, and the greater interest of the few broadleaved species found here. Among the latter group, the Pacific madrone is more readily recognized because of its persistent dark green foliage and striking reddish-brown bark, the black cottonwood by its large size, the big leaf maple by its large leaves, and the Pacific dogwood by its handsome blossoms and, in fall, clusters of red fruit. Yet, although the Oregon ash possesses none of the attributes which place greater emphasis upon most of our broadleaved trees, it may be readily distinguished by the nature of its foliage and fruit, and—in winter—by the characteristics of its leaf scars and buds.

Among the native hardwoods of the Pacific Northwest that attain tree size the Oregon ash is the only species that possesses compound foliage. Individual leaves, borne opposite upon the branches, are 6 to 12 inches long with a stout, angled and grooved stalk bearing from 5 to 7 pinnately-compound, yellowish-green leaflets, each from 3 to 6 inches long and 1 to 1½ inches wide. Leaflets are sometimes slightly hairy on the underside. Male (staminate) and female (pistillate) flowers are borne on separate trees and appear in the spring as compact clusters, at the same time as the leaves. The fruit of the Oregon ash, which of course is found only on pistillate trees, is characteristic of late summer and fall; the narrow seeds—about 1 to 2 inches long—are attached to a slender wing which is usually obtuse at the apex, and are borne in dense, pendent clusters.

Early in the fall the leaves turn yellow and drop, leaving upon the naked twigs characteristic half-round leaf scars, each marked on the surface with a C-shaped line of small vascular bundle scars. Buds are covered by several pairs of dark brown, hairy scales.

Largest specimens of Oregon ash are from 60 to 70 feet tall and up to 2½ feet in diameter. When found growing in the open the trunk is usually short and the crown widespreading; in the forest, however, the crown is narrow and the trunk longer and more slender. It is most common in moist locations of the Transition zone from southern British Columbia and the Puget Sound Basin, south along the coast to southern California.

Members of the olive family *(Oleaceae)*, the ashes *(Fraxinus)* include about 65 species of shrubs and trees widely distributed about the world. The Oregon ash is one of about six native American species which attain tree size. Although its wood resembles that of eastern commercial ashes the Oregon ash is not commercially important in this area because of its relatively limited abundance.

✓ ✓ ✓

"It is by no means convenient to plant Ash in Plow-lands; for the Roots will be obnoxious to the Coulter; and the shade of the Tree is malignant to Corn when the head and branches over-drip it; but in Hedge-rows and Plumps, they will thrive exceedingly, where they may be dispos'd at nine or ten foot distance, or sometimes nearer. But in planting of a whole Wood of several kinds of Trees for Timber, every third set at least, would be an Ash. The best Ash delights in the best Land (which it will soon impoverish) yet grows in any; so it be not over-wet, and approaching to the Marshy, unless it be first well drain'd: By the Banks of sweet and crystal Rivers and Streams, I have observ'd them to thrive infinitely."

John Evelyn, "Sylva," 2nd ed., p. 39 (1670)

*Another interesting article in our series on Trees Native to the Northwest, by Prof. Brockman of the University of Washington College of Forestry.

Oregon Ash—tree 74 feet tall, 35 inches d.b.h., at north entrance to Arboretum

(Fig. 18) —PHOTO BY E. F. (WHITIE) MARTEN

Shrubs for Northwest Coastal Areas

J. Harold Clarke *

THE PLANTS which may be grown in Northwest coastal gardens would make a long list as it would include not only the semi-hardy types which survive only along the coast, but also the hardy shrubs which form the backbone of midwestern gardens. These latter, however, cannot be automatically incorporated into our recommended lists, even though they may be able to survive temperatures much lower than ever experienced in the coastal areas. Our mild winters, short rest periods and cool summers sometimes interfere with that full maturity and hardening of tissues which are an essential part of their cold resistance.

My purpose here is to discuss more particularly the shrubs which survive only where the temperature usually does not fall below 15° F. I say "usually" because there is no guarantee that coastal temperatures will not go below that figure. But gardening is a venture anyway, a fight against pests and the elements. If one can enjoy a beautiful shrub for five or ten years before it is cut down by a freeze, perhaps unseasonable, his efforts have not been wasted. Our gardens are not static. Change is to be welcomed, provided it is for the better, and it is up to us to see that it is for the better. Young shrubs are often more beautiful than old ones. And so if the following lists include some things of doubtful hardiness, they are there advisedly, as well worth trying.

Native Broadleafs

Among the native evergreen shrubs are several good garden subjects. *Rhododendron macrophyllum* has been used in many gardens, especially around summer homes near the beaches. It grows abundantly near the ocean in the sandy soils of south central Oregon, as well as at higher altitudes on the Olympic peninsula and around Mt. Hood. It makes a large shrub, to ten feet across, and is most useful for background plantings as its rose pinkish color is not as pleasing as that of many cultivated varieties.

Vaccinium ovatum, the evergreen blueberry, is known in the florist trade as "huckleberry," and many carloads of the cut branches are shipped over the United States as "greens." It is useful as a medium-size shrub, especially for a shady spot, because of its attractive bright green foliage and coppery colored new growth.

Salal, *Gaultheria Shallon,* is seldom brought into a garden, but may be used quite effectively where it grows naturally, as a knee-to-waist-high ground cover. It is attractive because of its large, light green leaves, pinkish racemes of flowers, and purplish black fruit. Other ericaceous shrubs, smaller and a bit harder to grow, but very desirable, are our native laurel, *Kalmia polifolia,* and the rather rare *Kalmiopsis Leachiana.* The well-known kinnikinnick, *Arctostaphylos Uva-ursi,* another member of the heath family, is being used more and more as a ground cover.

The Oregon grape, *Mahonia (Berberis) Aquifolium,* and its dwarfer form *M. nervosa,* are well known. Not so commonly used is *Myrica californica,* the western wax myrtle, with its very inconspicuous flowers but an excellent foliage plant, especially for seaside use. The madrono, *Arbutus Menziesii,* is a small tree rather than a shrub but is very useful in accenting a shrub border because of its distinctively irregular growth habit, its reddish brown bark and bright red fruit.

Native Deciduous Shrubs

Many plants could be listed here. Outstanding perhaps is the western azalea, *Rhododendron occidentale,* a large shrub with beautiful and fragrant flowers, white to pink with yellowish stripes. The ocean spray, *Holodiscus discolor,* could be more often used as a background shrub, where its large white panicles will cascade gracefully over the lower foreground plants.

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*Dr. Clarke, a rhododendron nurseryman in Long Beach, Wash., was editor of the American Rhododendron Society's book, "Rhododendrons, 1956."

Near the coast the red blueberry, *Vaccinium parvifolium,* is a good upright shrub for shady places. A very beautiful, early flowering, neat and attractive shrub is the red-flowering currant, *Ribes sanguineum.* As background material for rather large gardens the native elderberries, *Sambucus coerulea (glauca),* blue, and *S. callicarpa,* red-berried, are striking and quick-growing, but may need some pruning to keep them under control.

Important Groups of Evergreen Shrubs

In coastal gardens the broad-leaved evergreens are at their best. Rhododendrons, including the azaleas, probably head the list, but with hundreds of species and thousands of varieties further discussion of this great group is hardly feasible here. Somewhat the same statement may be made for camellias, with fewer species it is true, but with a very large number of varieties.

The other evergreens, conifers and yews, are used freely, but not so exclusively as in midwestern and eastern gardens. Our broad-leaved evergreens provide greater variety and flowers as well.

And then there are the heathers, another extensive list, mostly used as ground covers but including many shrubby forms. Rather than treat these four important groups hastily it seems better to recommend them to serious gardeners for further study and simply say that some of each should be found in most coastal gardens.

Other Broad-Leaved Evergreens

A very fine group of rather small-leaved, long-blooming plants is the escallonias. *Escallonia rubra, E. macrantha,* and a number of hybrids, "Langleyensis," "Iveyi," "C. F. Ball," "Apple Blossom," "Eric Walther" and others are well worth trying. They are relatively resistant to ocean winds, hence good for seaside gardens.

Below:

Mahonia nervosa

(Fig. 19) —PHOTO BY DON NORMARK

Hollies are usually thought of as trees but there are shrubby forms, some with small box-like leaves. The ordinary *Ilex Aquifolium* has forms, particularly in the variegated varieties, which produce tall shrubs, excellent for specimen planting. My own experience with the *Ilex cornuta* varieties, so good in the south, has not been very satisfactory so far.

The Hebes constitute a group of New Zealand plants, sometimes called Veronicas, but considered here as the woody or evergreen species and varieties, as opposed to the herbaceous perennial Veronicas. From mid-Oregon south *Hebe* imperialis is worth trying for seaside gardens. Somewhat more hardy are *H. Buchananii,* low and spreading; *H. buxifolia, H. salicifolia, H. cupressoides* and others. The variety "Autumn Glory" is a late summer-blooming, bluish-violet flowered clone in the Northwest nursery trade.

Various clones of Pernettya are available, differing mostly in color of berries, which are quite conspicuous. The leaves are small, pointed, dark green and the overall effect is good throughout the year.

Of the several types of Pieris, probably the handsomest is *Pieris Forrestii,* notable for its flowers as well as the reddish color of the new shoots in spring. Unfortunately it is somewhat tender, but certainly worth trying in the more protected gardens. *P. japonica* and others are less showy but more hardy.

Andromeda Polifolia is a very fine, low-growing shrublet bearing small flowers resembling those of mountain laurel. Mountain laurel itself, *Kalmia latifolia,* is an excellent plant, used less in the Northwest than in the east where its hardiness is an important factor. Some large flowering plants of improved color have been selected, known collectively as the Dexter strain.

Mexican orange, *Choisya ternata,* has very

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Below:

Ocean Spray *(Holodiscus discolor)*
(Fig. 20) —PHOTO BY E. F. MARTEN

Woody Plants for Extreme Coastal Exposure

W. H. Warren *

THE following brief notes have been accumulated over the past twenty-five years in an endeavor to find and utilize the hardiest material available for planting on heavy clay soil at Ross Bay Cemetery in Victoria, B. C. This waterfront area is located at sea level, fully exposed to southeast and southwest gales from the Strait of Juan de Fuca, which usually occur during the fall and winter months. Further useful information was gained following the severe frosts of November 1955 and December 1956.

The injury sustained in seashore exposures is chiefly a combination of wind dessication and salt spray injury. In this connection it is interesting to study the growth of native material in exposed coastal positions. On the front line are such natives as the twin berry, *Lonicera involucrata,* ocean spray, *Holodiscus discolor,* Salal, *Gaultheria Shallon,* and red alder, *Alnus rubra.* These can take exposure in front of Sitka spruce, *Picea sitchensis.* Other natives which are slightly less tolerant are the wild choke cherry, *Prunus emarginata,* and some of the native willows.

Several others which stand up in the second line of defense include the wild rose, *Rosa nutkana,* wild crabapple, *Malus fusca,* snowberry, *Symphoricarpus albus,* and probably shore pine, *Pinus contorta,* and buffalo berry, *Shepherdia canadensis.*

Amongst the exotics are two which are outstanding, Austrian pine, *Pinus nigra,* and slippery elm, *Ulmus fulva.* There was one other, which is now crossed off our list, which did exceptionally well until killed outright by the heavy frost of November 12, 1955, when the temperature suddenly dropped from about 65° to near zero. This was the Japanese Black Pine, *Pinus Thunbergii.* I think probably it is worthwhile taking a chance and using this pine again, for it withstood the full brunt of the storms in the front rank without injury.

The slippery elm, *Ulmus fulva,* is a first rate front rank subject. A specimen has been growing and thriving in the most exposed part of Ross Bay Cemetery within 25 yards of the sea on heavy clay soil for the past 50 years without ill effects. Many hundreds of cuttings taken from it are also doing well though growing slowly in equally exposed positions.

In the literature of Great Britain there is considerable information concerning seaside planting. The use of a windbreak on the seaward side where there are incessant winds is greatly emphasized. Fencing is recommended for this purpose, also thick hedge plantings. Amongst the plants recommended for such sites are the common broom, gorse, *Lonicera nitida,* and many others not fully hardy here; but those first enumerated above are all more tolerant than these, and of these the Austrian pine is the toughest.

Quercus Ilex, the Holm oak, I have noted, grows extremely well in exposed positions; but I was never successful growing it on the heavy clay soil at Ross Bay Cemetery. *Pinus Mugo (montana),* recommended elsewhere, was also unhappy and finally succumbed; but probably not entirely due to salt spray. *Acer Pseudoplatanus,* the Sycamore Maple, stands exposure, but I do not think it stands up to the full blast.

Among those recommended which we have not used but may be worthy of a trial are the rugosa and multiflora roses, black elderberry, *Lonicera Morrowii* and *L. tatarica,* and the white beam tree, *Sorbus Aria.*

The general impression I gather is that those deciduous plants which are hardy and tough, leaf out late, ripen their wood early and carry small leaves, are most likely to succeed. Tamarisk might be mentioned as a good example.

On sandy locations on the eastern seaboard,

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*Mr. Warren is Administrator of Parks, Victoria, B. C.

Trees and Shrubs for Exposed Situations on the Northern California Coast

PAUL J. BOWMAN*

NO GARDEN on the northern California coast, exposed to the Pacific Ocean's winds, can survive unless it has a satisfactory wind break, or it contains plants, shrubs, and trees which are indigenous to such windswept areas in this or other parts of the world.

The wind itself is destructive, not only because of its velocity and force, but more so because of its heavy content of fine sand and salt. It burns foliage just as surely as fire.

However, the increased moisture borne by the gentler breezes and by the fog makes for the more rapid growth of plants and an ideal environment for such moisture-loving plants as azaleas and rhododendrons.

The problem resolves itself into the use of shrubs and trees, either indigenous or foreign to the area, living windbreaks and screens, as a protection to the more tender plants in our gardens. They may be grown as individual specimens or as a hedge.

As has been said of the Cornish coast of the British Isles, "our trees are shrubs and our shrubs are trees." All of us probably have seen personally or in picture what happens to the Monterey cypress, beach pines, Bishop pines, salal, huckleberry, coyote brush, and scrub as they grow next to the beach and sand dunes. They are all flattened, some almost prostrate, pointing away from the terrific coastal wind.

One can never forget a drive out the Cape Blanco, Oregon, road, when it was impossible to hold the car door open toward the wind. The matted scrub was only a foot or two in height, held to that height for many years by the continuous blow.

From the above description one might get the impression that we live in a continuous miniature hurricane. Such is far from true. These hard winds occur mostly in Spring and Fall, often preceding a rain. They last generally two to three days at a time. Otherwise, the climate is equable, without snow, and the temperature rarely below 20° F.

Native Shrubs and Trees

There are many very low growing shrubs found right down to the shore line. These will be found to grow much taller as their distance from the shore line increases. Such shrubs are species of Abronia, Alnus, Arctostaphylos, Baccharis, Ceanothus, Eriogonum, *Garrya elliptica, Ledum glandulosum, Lupinus arboreus,* Mesembryanthemum, *Myrica californica* (Wax myrtle), *Gaultheria Shallon* (Salal), Salix, Umbellularia and *Vaccinium ovatum.*

Native trees do not approach the shore so closely although there are specimens of *Pinus contorta* (Beach Pine) growing on small islets cut off from the main shoreline by the ever-pounding and cutting breakers. This pine is very remarkable in that it may be a cane two to five feet in height on the Mendocino coastal plain, while in the Sierras it is the lodgepole pine up to 100 feet in height.† Transplanted into the garden it becomes a tall tree.

Pinus muricata (Bishop Pine) is the native pine found in association with the above beach or scrub pine. It is just as resistant as the latter. Grand fir *(Abies grandis),* Douglas fir *(Pseudotsuga taxifolia),* Sitka spruce *(Picea sitchensis),* and *Torreya (Tumion) californica* are also native here. The last named two are only occasionally found, as well as *Tsuga heterophylla,* the western hemlock.

Cupressus macrocarpa and *C. pygmaea* are very numerous. The latter occurs as a cane

*Dr. Bowman, who has a garden on the coast of northern California, is a charter member of the American Rhododendron Society.

†The latter is sometimes distinguished as var. *latifolia* Engelm. (Ed).

one to five feet tall, bearing cones, on the coastal plain, or it may grow up to 100 feet in boggy areas. The former cypress has been introduced from the Monterey coast and is used extensively for large windbreaks.

Lithocarpus densiflorus (Tan Oak) also occurs in the above group as a scrub.

Introduced Shrubs and Trees

Into this area have been brought shrubs and trees from other parts of the Pacific Coast and from areas of similar exposure throughout the world.

Cytisus scoparius (Scotch Broom) and *Ulex europaeus* (Gorse) are mentioned, on the one hand, to call attention to their beautiful golden flowers, while, on the other hand, to warn that they become difficult to control and are considered fire hazards, especially the latter.

Abelia, *Berberis Darwinii,* Callistemon, Cotoneaster, *Eugenia apiculata, E. paniculata, E. Smithii, Euonymus japonica,* Hypericum, *Metrosideros lucida, M. tomentosa, M. villosa,* Osmanthus, Pyracantha (these blight easily here), *Taxus cuspidata,* and Veronica, may be used as specimens or as hedges.

We have above listed few deciduous shrubs, although many are grown here, back of a primary screen of the above trees or shrubs. Such are grown as Crataegus, Deutzia, Forsythia, Kolkwitzia, Tamarix, Viburnum, and many others. Heathers grow well here with protection.

Special mention should be given to Escallonia, Eucryphia, Ilex, Leptospermum, and Rhododendron.

Escallonias stand high in the rank of shrubs for exposed situations, either as specimens or as hedges. Their rapidity of growth is remarkable. There are at least ten species and numerous hybrids and clones cultivated here, in color from white through pink, rose and red. A group in the garden soon gives rise to many seedlings which, if grown, further confuse the identification but do not detract from our purpose. The Royal Horticultural Society's Dictionary of Gardening lists numerous species and hybrids. Many of these are obtainable from our local nurseries. The escallonias may be heavily pruned after flowering. They do have a tendency to layer and spread at the base if not kept in bounds. Special mention should be given to *E. Berteriana, E. macrantha, E. rosea, E. rubra, E. montevidensis, E. organensis,* and *E. virgata* (the most hardy) with many hybrids.

Eucryphias stand considerable wind but not full exposure. These are mentioned because of their beautiful white flowers with pink stamens in August and September. Hardy here are *E. glutinosa, E. lucida, E. 'Nymansay' and E. 'Rostrevor.'*

Ilex Aquifolium (English Holly) is not only exposure-resistant but gives us an abundant crop of red berries for the holidays.

Leptospermum laevigatum was used at Golden Gate Park and still is used for resisting wind as well as shifting sand. *L. scoparium* has given rise to many beautiful forms both single and double, notably the U. C. L. A. hybrids.

Rhododendrons should be mentioned because, although very few will stand full exposure to the ocean wind, many of them will stand considerable wind, if it is moisture-laden, off the ocean. Such include *R. macrophyllum, R. occidentale, R. ponticum, R. crassum, R. Maddenii, R. manipurense,* and of course, the old iron-clad hybrids. When protected from direct exposure this area furnishes the ideal rhododendron environment.

Of all the introduced trees none can compare, in rapidity of growth, in shape, in beauty, and in being completely unspoiled by exposure, with *Pinus radiata* (Monterey Pine), used as magnificent specimens or as windbreaks. *Pinus Torreyana,* another California native, does well here. *P. densiflora, P. nigra* and *P. pinea* are also growing in full exposure.

There are some noble fir *(Abies procera),* Acer, monkey-puzzle *(Araucaria araucana),* strawberry tree *(Arbutus Unedo),* Port Orford cedar *(Chamaecyparis Lawsoniana), Crinodendron dependens, C. Hookerianum,*

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Wall Shrubs and Climbing Vines

Mrs. J. A. Hibberson*

AGES ago in the beginning of all things, when this earth of ours was in its infancy, when soil was first formed by the erosion of rock, the mystery of plant life was created. The first green life, the smooth algal slime was formed, which grew and developed into the fronded beauty of moss and fern. Wherever plant life can be sustained on this planet, we behold the mystery and miracle of growth. We see it from the single cell, through varying and widely differing stages, to plants capable of providing food for animal and man; we behold in wonder, and stand in reverence of the wise Creator, Who fashioned these things for our need, use, and enjoyment.

Amid this vast array of plant life, so well designed and adapted to the purpose for which they were created, is an important group of plants known as Climbers and Trailers. The trailers are plants which creep over the ground, rocks, fallen logs, covering the earth with a mantle of greenery. The climbers differ, in that they are fitted to climb up and over trees, rocks, etc., draping them with curtains of delicate, lacy loveliness, or in handsome swathes of green vigorous foliage in varying tones and colors.

Wherever we travel by car, rail, or on foot, we are constantly being attracted and pleased by the variety and charm of these climbing and trailing plants. We see them gracing the walls of mansions with their beauty, and just as charmingly adorning the walls of smaller houses and cottages, adding softness and loveliness. Sometimes we meet them in the most unexpected places, in the midst of a busy, stony city, where, with no attention whatsoever, like a lone city sparrow, they bravely grow and strive to do their bit to brighten up the lives of those who have eyes to see and minds to appreciate.

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The landscape value of climbing plants is beyond question. They are extremely useful and most desirable in the garden picture for their decorative qualities. The trailers are useful as ground covers, hiding unsightly banks or covering bald, ugly rocks, transforming them into objects of interest and beauty. Especially useful for slopes where soil erosion is a major problem are those trailers which possess masses of fibrous roots. Climbers are principally used for the charm they can give to buildings, for providing lovely background effects in the garden, for the draping of pergolas and arbors, for the covering of trellis, walls or fences, for providing shade, wind protection, or privacy; they also give shelter to birds, man's best friend in the garden.

Almost all plant nurseries carry lists of climbers from which to make a choice, but before making a selection it is well to acquaint oneself with the habits of these plants, the manner in which they climb, etc. Some require supports while others are self-supporting. Every garden lover who has observed the workings of nature must have been thrilled at the ingenuity and sensitivity of the slender tendrils of these plants which search for a suitable support with uncanny instinct, as though they have the gift of sight, much in the manner of an insect using its antennae. Once the support is felt it is eagerly grasped and a first secure hold is obtained. It is interesting to note that with some plants the tendrils twine only to the right while others insist upon turning to the left. Also interesting and clever is the manner in which some vines will twine their tendrils in opposite directions. Upon securing a hold, they contract backwards and twist spirally in the manner of a spring, giving with the wind, holding the vine securely in the wildest of gales. Some tendrils have no power to climb but seek out a crevice and thicken therein, provided the crevice is not too wide. Other tendrils are short and have discs at the end of their tips

which have the power to secrete a cement and hold their vines snugly to wall or wood. These are the self-supporting vines such as Virginia Creeper, Ivy, etc.

In selecting your vines great thought must be given to the purpose for which it is to be used. One would hardly think of planting a vigorous large-leaved climber such as Aristolochia (Dutchman's pipe) on a building of great architectural beauty. There the choice should be a small-leaved, wall-hugging climber, which would embellish, not hide, the fine architectural lines. The looser growing vines are very properly used for disguising poor architecture, for hiding faults, removing an eyesore and transforming it into something pleasing to look at. Especially useful for draping a sun-baked verandah or to give dense shade on a pergola or arbor are the very large-leaved varieties.

Ornamental trellises are often fastened to walls of houses for the purpose of training a vine upon the wall, or a flowering shrub such as a Forsythia, Ceanothus, Camellia, Magnolia, etc., giving somewhat the same effect as a climber. Care should be taken to see that the trellis is not fastened directly to the wall. Allow a space behind of at least a foot for free circulation of air. This practice is useful, too, where a wall surface has occasionally to receive treatment. Incidentally, your climber will do very much better than when fastened directly to the wall.

As with all plants, their success depends largely upon the preparation of the soil. Climbers are usually vigorous growers, and require water and food in abundance. They are to be in their positions for a very long time so attention must be given to the digging and enriching of the soil. Drainage, too, is important. A large hole must be dug, then clinkers or small rocks placed at the bottom, covered with a layer of leaves. The lifted soil must be well mixed with rotted manure, crumbled rotten wood, leaf mould, peatmoss, and bonemeal. In heavy soil plenty of coarse sand, or better still, river sand which is like minute pebbles must be added. Set the plant well and firmly and water immediately. Drench with very weak liquid manure two or three times during the flowering season. A good rule to follow is to prune all early spring flowering climbers directly after flowering and all late-flowering species in early spring. Prune to shape, removing all dead or very weak growth.

An excellent book, entitled "Climbers and Ground Covers," has been given us by Alfred Carl Hottes. It mentions a comprehensive list of interesting and beautiful climbing and trailing plants. It is literally packed with excellent information.

A few climbers which are known to grow well on south Vancouver Island are:—

AKEBIA. A dainty Chinese and Japanese vine. A rapid grower with wonderfully attractive trifoliate oval leaflets on little stems, which meet to make up a complete leaf. The effect is unique and pleasing, and, while the vine does not cast a dense shade, it is very desirable for use in places where dense shade is not required. It is perfectly hardy and free from disease. Flowers are rosy purple or violet brown, one inch in diameter, produced in clusters, and have a pleasant spicy fragrance.

ADLUMIA (Alleghany-vine) is a very attractive biennial which is regarded as perennial owing to the fact that it re-seeds itself so generously, once planted, that you are never without it. It has fine fern-like foliage and tiny white or lavender-pink blossoms. Its extreme airy gracefulness commends its use where a mantle of greenery without casting shade is required. It likes rich, moist soil in part shade.

CELASTRUS (Bittersweet). The orange-scarlet fruits of the Bittersweet add a vivid note to the autumn landscape. It is a quick growing climber of rambling habit. Its stems twine and twist round any support it can find, or round its own stems like tightly twisted rope. The plants can produce both male and female flowers. To assure a crop of berries—its chief charm—several seedlings should be planted in close proximity. It thrives on slightly acid soil where there is good drainage.

CLEMATIS. A wealth of beauty is to be found in this popular family of climbers, from the many species to the countless hybrids. Among the species a particularly fine one is our own native *Clematis occidentalis (columbiana),* with its lovely powder blue flowers from two to four inches across. It is a slender climber hardly noticeable until in flower, when the sight of its lovely blossoms, so gracefully adorning the slender branches of the small trees it favors, really provides one with a thrill. It likes cool, woodsy soil and prefers light shade. *C. montana* from the Himalayas is a very vigorous, hardy and lovely species. The snow-white, anemone-like flowers are most attractive, and also the blush pink form, *rubens,* and *rubens grandiflora,* a deeper, richer pink. When in bloom the flowers literally cover the whole plant in a solid sheet of loveliness. A pergola carrying all three shades of these lovely flowers intermixed is a sight not easily forgotten. *Clematis tangutica*—the yellow Clematis—which hails from northern China, is another charming species. It is a quick growing climber, and when well established provides a lovely shower of golden blossoms which hang like miniature Chinese lanterns. The extremely large, fluffy seed heads which follow are exceptionally beautiful. *Clematis texensis* is a very attractive climber which revels in a warm spot. It is excellent for covering rocks since it appreciates the reflected heat. The flowers are leathery, vase-shaped, and a brilliant scarlet. It dies to the ground most winters but starts vigorous growth in the spring. *Clematis Jackmani* and hybrids—the large flowered clematis—noted for their spectacular beauty and richness of color, are the most popular and the more difficult to grow. They enjoy cool, rich, loose soil. If your soil is heavy mix in plenty of coarse sand, peatmoss, and old well-rotted manure; also a good dressing of old mortar rubble, well mixed in. Dig the hole much larger than is required for the roots. Plant at least six inches deep. These clematis are generally grafted for quick sale by nurseries. If planted deep, in the course of time new roots will form on the main stem; the clematis will then be on its own roots and a longer life and better flowering is assured. Clematis roots are easily injured; once planted avoid digging in the soil near the roots. While the clematis loves to have its flowers in the sun, it insists on cool conditions for the roots and lower portion of the stem. A clematis can die from sun-stroke within twenty-four hours if the lower stems are subjected to prolonged burning heat. They enjoy copious amounts of water and fairly frequent applications of weak liquid manure in the summer.

CEANOTHUS *dentatus* is another delightful wall shrub. It has small notched evergreen leaves and clusters of deep blue flowers in spring. *Ceanothus* "Gloire de Versailles" makes an excellent wall cover with its large sprays of powder blue flowers, July to September. Prune to shape immediately after flowering, but harder in March-April. It likes a fairly sheltered position.

CHAENOMELES *lagenaria* is the *Cydonia japonica* of gardens. It is a magnificent shrub for covering walls, decorated in early spring with large, beautiful red flowers. Side shoots should be trained to the wall and all breast wood cut severely back to three or four inches.

FORSYTHIA *suspensa*—Golden Bells. Is a shrub of such pendulous habit it is frequently used for walls, or covering lattice, or draping over a bank, where the tips, touching the soil, will root and grow, holding the soil from washing and covering the bank with a sheet of pure, brilliant gold in early spring.

HYDRANGEA *petiolaris*—Climbing Hydrangea. There are few shrubs which are able to cling to stone. *H. petiolaris* is especially worthwhile. Its flowers are very much admired. It prefers the north or west side of a building where it will not get too much sun in early spring. Growth at first is slow but once it is established it is a rapid and beautiful grower.

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Species and Old-Fashioned Roses

Martha L. Isaacson *

IF YOU LIKE ROSES, and who doesn't, try exploring the field of the species and old-fashioned roses. You will be rewarded by one of the most fascinating and interesting of horticultural experiences. The rose, you know, is the oldest known cultivated flower, going back into antiquity some thirty-five million years! Rose fossils found in Oregon substantiate this fact. These species, and the so-called old-fashioned roses, which are the ancestors of all of our modern hybrid tea roses, ask so little and yet give so much. They have practically no pests so require little spraying; they will grow in very poor soil so require little fertilizing, and if given ample space they need almost no pruning. They have amazing powers of endurance as is evidenced by the number of these old roses found still flourishing in old, neglected gardens.

These roses bring into our gardens a quality of naturalness, as they need not all be planted in one formal rose-bed as becomes their more cultivated relatives, the hybrid teas. In fact their form and habit is so varied that one can find an old-fashioned rose to fit almost any requirement, and their use in the garden is almost endless. They adapt themselves to adverse conditions like no other rose. *Rosa Hugonis,* the golden rose of China, for example, will grow on a sandy bank other shrubs would not tolerate. In spring its arching branches are covered with lovely yellow single roses, surrounded by the most beautiful, fern-like foliage which in itself would make the bush worth growing, and as if that were not enough, it produces small, dark-red rose hips and its foliage turns a beautiful bronze to give late summer color.

Rosa damascena is one of our oldest, if not *the* oldest rose, growing today. This is the old rose of Damascus which was brought by the Crusaders to France and later in the 16th Century to England. There are many varieties of the Damask rose, all of them beautiful, and all of them saturated with a wonderful fragrance. Fragrance is an attribute of almost all the old-fashioned roses as well as most of the rose species. They are imbued with the delicious perfume which most of us associate with a rose, but which so many of our hybrid tea roses have lost in the process of breeding. The Damask roses are those used in the manufacture of attar of roses.

Another favorite of mine is the species *Rosa rugosa alba.* This rose, with its glossy, leathery foliage, its tight pale pink buds which open into large single white blossoms, fits perfectly into the shrubbery border. It also makes wonderful hedge material. It blooms all summer, and even before the bloom is over, large rose hips form, so that all at one time the bush displays blossoms and green, orange, yellow and red rose hips which make this an always colorful and effective shrub. I have grown hundreds of these roses from seed and so far they have always come true to color. *Rugosa* comes in red and pink also, but the white one I like the best.

There are creeping varieties which make excellent ground covers for difficult banks. The Wichuraiana rose "Memorial" is one of these and has white flowers, while "Max Graf" has pink ones. These creeping varieties can also be used effectively to soften the edges of stone steps or to cover a bare space in the rockery.

A few of my other favorites are "Harison's Yellow" which many of you know as that early spring bloomer with the round, double, unfading, yellow blooms. It will take all kinds of punishment. *R. spinosissima* is another early bloomer and can be had in both yellow and white. This is the old Scotch Briar rose and it too has crisp, fern-like foliage. "Cardinal de Richelieu" is a Gallica rose

*Mrs. (Henry C.) Isaacson is a long-time member of the Arboretum Foundation and on its Board of Directors. Her great interest in old roses is well known to her friends.

and has a deep purple hue. It looks very well planted with "Variegata di Bologna," a pink-and-white striped rose. "Rosa Mundi" is another pink and white rose, although not so striped as the former.

Moss roses give an old-fashioned touch to a garden and these thrive best in poor soil. In rich soil they produce mostly foliage and little bloom. The flowers are borne in spring and early summer.

I have twenty-five varieties in my garden all of which I dearly love, and of course the list of these old roses, which are all available, is endless, so choose the ones which suit you best. It is true that most of these roses are not continuous bloomers, but they come into flower before the hybrid teas, and produce hips and colored foliage which do so much to give color to the garden when color is usually lacking. Because they don't continue to bloom all summer makes them all the more appreciated and reminds us that "beauty and simplicity walk hand in hand."

Effects of the Early Freeze at Royston, Vancouver Island

Mary Greig*

THE editor has invited us to give readers of the Arboretum Bulletin some of the results of the November 1955 freeze on rhododendrons in our garden at Royston, Vancouver Island. Before going any further, however, I should like to say that in our opinion the set of most unusual circumstances —cold dull summer, hot moist fall which encouraged renewed growth, and sudden terrific drop in temperature in early November—did not really give a true picture of hardiness or the reverse. The following harsh and dry spring further discouraged recovery of damaged plants. Quite ordinary shrubs were damaged so severely here that they are still only recovering, among them *Forsythia spectabilis,* most of the climbing roses, American Pillar and the like, and most of the bush roses. That season, too, many of the Callunas were entirely killed while the normally much less hardy *Erica vagans* and *E. cinerea,* which do frequently suffer cut-back, were not hurt at all. Also a number of the evergreen Japanese azaleas which generally are so badly cut here that they are not worth growing, wintered much better than usual! Walking round the garden after the frost, a number of rhododendrons had made the usual leaf curl against the cold, and those plants looked very sick. Some, however, had not curled at all, and at the time seemed not to have suffered, but, generally speaking, it was the latter group which suffered most severely. As one would expect, most of the very early flowering species and hybrids suffered less than those which matured late, but there were exceptions to that, too, namely *R. moupinense, R. leucaspis, R. cilpinense* and so on.

The following lists will give some idea of results at Royston.

A. Considered by us to be perfectly hardy here, even in brief zero (F.) spells.

Killed outright

R. concatenans; series Cinnabarinum. All young plants killed at once. One 20-year-old plant did throw one strong shoot late in the summer of 1956, but that was not ripe enough to survive the following severe winter.

Augustinii; young plants (4-5 years old) were killed.

cilpinense; all mature plants killed; some young plants were merely cut to the ground and have since recovered.

cinnabarinum; all young plants killed.

cinnabarinum var. *Roylei;* all, young and mature, killed.

coriaceum; s. Falconeri.

diaprepes; s. and s. s. Fortunei; this plant had

*Mrs. Greig has been a skilled propagator and grower of rhododendron species for many years at Royston, B. C.

been selected for its hardiness as well as handsome flowers, and had previously survived below zero with no damage. It made late growth from the root the following summer, like *R. concatenans,* but the shoot was not ripe enough to survive the following winter.

'Fabia'; an unnamed form we have had for many years which has withstood below-zero temperatures. The old plant survived but is not back to full vigor, and all young stock was killed.

glischrum; s. Barbatum, s. s. Glischrum; all young plants killed outright. One very old plant appeared to be undamaged, flowered normally the following spring and died immediately after. The bark splitting which caused death was not at first apparent.

Keysii; s. Cinnabarinum; two forms, both killed.

lutescens; s. and s. s. Triflorum; old plants and some young killed.

Martinianum (Rock 57); *s. Thomsonii, s. s. Selense;* nearly all killed.

niveum; s. Falconeri.

Forrestii var. repens; s. Neriiflorum, s. s. Forrestii; a few 4- 5-year-old seedlings killed; most survived.

Sargentianum; s. Anthopogon.

Sanguineum series; (Rock 23).

selense; s. Thomsonii, s. s. Selense.

B. Plants of only borderline hardiness here in normal winter, possibly down to zero briefly.

Killed

R. auritum; s. Boothii, s. s. Tephropeplum.

arizelum; s. Falconeri.

bauhiniiflorum; s. and s. s. Triflorum; all young plants killed, mature plant untouched.

caeruleum album; s. Triflorum, s. s. Yunnanense.

crinigerum; s. Barbatum, s. s. Crinigerum; only one or two survived.

deleiense; s. Boothii, s. s. Tephropeplum; a few made growth from base, most were killed.

didymum; s. Neriiflorum, s. s. Sanguineum; about half were killed, others cut down.

'Fabia', F2.

leucaspis; s. Boothii, s. s. Megeratum.

Morii; s. Barbatum, s. s. Maculiferum.

neriiflorum; s. and s. s. Neriiflorum; all forms killed.

pruniflorum (tsangpoense); s. and s. s. Glaucophyllum.

pennivenium; s. and s. s. Irroratum.

uvarifolium; s. Fulvum.

Weyrichii; s. s. Azalea, s. s. Schlippenbachii.

C. Normally hardy to below zero, cut to ground or almost defoliated, but recovered.

auriculatum; s. Auriculatum; all young plants up to 5 or 6 years old, not cut to ground but severely damaged.

Augustinii; s. Triflorum; s. s. Augustinii; plants 6 years and over cut back hard.

basilicum (or Hodgsonii); s. Falconeri. This plant is at least 30 years old and has never before shown any winter damage, even to 10 below zero (F.). Not completely defoliated, but quite considerably. It appears to have recovered.

barbatum; s. and s. s. Barbatum; both defoliated and cut.

charitopes; s. and s. s. Glaucophyllum; parts of 10-to-15-year-old plants killed, with further die-back last summer, but they seem recovered now.

caesium; s. and s. s. Triflorum; all ages cut to ground.

chasmanthum; s. Triflorum, s. s. Augustinii; cut almost to ground but good recovery.

cinnabarinum; s. Cinnabarinum; all 10-year-old plants cut to ground but most have made strong, new growth.

cloiophorum; s. Neriiflorum, s. s. Sanguineum; damaged but not severely.

cyanocarpum; s. and s. s. Thomsonii; defoliated, but completely recovered.

decorum; s. and s. s. Fortunei; tender forms were bark-split though not all killed. Hardy form was untouched.

exquisitum; s. Triflorum, s. s. Oreotrephes; cut to ground.

fulvum; s. Fulvum; defoliated, recovering.

glaucophyllum; s. and s. s. Glaucophyllum; a few killed, most cut back.

(Continued on Page 163)

Phytophthora Root Rot Diseases of Ornamentals

Roy A. Young *

Introduction

HORTICULTURAL varieties of *Chamaecyparis lawsoniana* Parl., known to nurserymen as Lawson cypress and to foresters as Port Orford cedar, are used extensively in landscape and windbreak plantings in the Pacific Northwest. Consequently, large numbers of cypress are propagated in Northwest nurseries. In recent years root rot diseases, caused by two species of fungi in the genus *Phytophthora,* have become increasingly destructive in nursery, landscape and windbreak plantings of cypress in the Northwest. Thousands of two- and three-year-old cypress trees have been killed in nursery plantings and many old established trees in landscape and windbreak plantings have been lost. The cypress fungus, *Phytophthora lateralis* Tucker and Milbrath, has been responsible for most of the losses in nursery plantings and also for the death of native Port Orford cedar in southwestern Oregon forests. Fortunately, this fungus attacks only *Chamaecyparis* species. The cinnamon fungus, *P. cinnamomi* Rands, which causes root rot diseases on many different species of plants over the world, has also killed many cypress trees and in addition has killed yew, heather, rhododendron and other plants in nursery and landscape plantings.

History and Distribution

In the late 1930's a root rot disease of varieties of Lawson cypress and Hinoki cypress, *C. obtusa* (Sieb. and Zucc.) Endl., was observed in western Oregon nursery and landscape plantings. This disease was found to be caused by a previously unreported fungus, *Phytophthora lateralis* (2), presently referred to as the cypress fungus. The prevalence of cypress root rot in Lawson cypress plantings has increased greatly since first observed. It is also a serious problem in Washington and British Columbia. The cypress fungus has not been reported outside of the Pacific Northwest and is apparently native to this area.

In 1950 another *Phytophthora* species, *P. cinnamomi,* was found to be the cause of a root rot disease of Lawson cypress varieties with symptoms identical to those caused by the cypress fungus (1). In addition to Lawson cypress, the cinnamon fungus causes a root rot disease of English yew, *Taxus baccata* L.; Irish yew, *T. baccata* var. *stricta* Laws. (*T. baccata* var. *fastigiata* Loud.); Japanese yew, *T. cuspidata* Sieb. and Zucc. var. *nana* Rehd., rhododendron, *Rhododendron ponticum* L.; spring heath, *Erica carnea* L., and two varieties of heather, *Calluna vulgaris* (L.) Hull var. *alba* (West) Don, and *C. vulgaris* var. *aurea* Don, and many other plants.

Symptoms of Root Rot on Cypress

The foliar symptoms of cypress root rot are frequently confused with foliar changes that occur when plants die as the result of transplanting injury, winter damage, or poor drainage. However, upon careful examination, it is usually possible to determine whether or not a plant is dead or dying as the result of an attack by one of the organisms causing these root rots.

Symptoms of the root rot of cypress caused by the cypress fungus are identical to those of the root rot caused by the cinnamon fungus. Only by isolating the causal fungus in the laboratory can the species of *Phytophthora* responsible be determined. Both fungi invade the roots of plants and spread into the lower part of the main trunk, killing all tissues as they advance. If the outer portion of the bark at the crown of a diseased plant is removed, a sharp line of demarcation between living and dead cells is apparent. About the time the fungus reaches the crown of the plant, foliar symptoms begin to develop. The first foliar symptom in the blue cypress varieties is the gradual disappearance of blue pigments until only the green under-color remains. The color eventually fades to a tan or light brown and the foliage becomes crisp and dry. The only foliar symptom in the green varieties is a

* Dr. Young is plant pathologist at Oregon State College, Corvallis, Ore.

gradual fading of color until the plants are tan or light brown and dead. The first color changes are especially apparent if the diseased plant is adjacent to a healthy plant. When the weather is cool and damp, these color changes may develop over a period of several months, but if the weather is hot and dry, the entire sequence may occur in two to three weeks.

How the Diseases Spread and Develop

Dissemination of the cypress and cinnamon fungi from one area to another appears to occur primarily through the movement of diseased plants or infested soil. As a large amount of nursery stock is continually being moved from nursery to nursery and from nursery to landscape plantings, both within states and from state to state, dissemination of these fungi readily occurs.

Both the cypress fungus and the cinnamon fungus are capable of living in the soil for long periods of time. When susceptible host plants are present these fungi may invade the roots of the plants, killing root tissues and eventually the whole plant. The rapidity with which either of the two fungi will spread through and destroy a planting of susceptible plants is influenced by such factors as soil type, moisture content, temperature, pH and microflora.

Local spread of the fungi from plant to plant is accomplished by the movement of motile spores (zoospores) through the soil water, or by the movement of infested soil by surface drainage water, cultivating tools and equipment. Since the soil temperature must be about 70 degrees C. before motile spores are produced, dissemination by this means probably occurs only in the late spring or summer.

Control of Phytophthora Root Rot

The best method of control is to avoid introduction of infected nursery stock or infested soil into plantings since there are the principal means of spreading the pathogens. When plants in a landscape planting are killed by Phytophthora root rot, susceptible plants should not be replanted in the same spot. *Juniperus* and *Thuja* species are resistant to root rot and a large number of varieties of these plants are available for use in place of *Chamaecyparis* species. If one particularly wants to replant a Lawson cypress variety, the soil in the root zone of the previously killed plant should be thoroughly drenched with formaldehyde (1 pint in 25 gallons of water) then allowed to dry until no formaldehyde odor can be detected before planting.

Following are a few specific control suggestions:

1. Provide good drainage. *Phytophthora* species are favored by high levels of soil moisture.
2. When removing dead or dying plants avoid spreading soil or roots around other plants.
3. Use resistant varieties for hedgerow plantings. A list of susceptible and resistant varieties can be found in Oregon Agricultural Experiment Station Bulletin 537.

References

1. Torgeson, D. C., Roy A. Young and J. A. Milbrath. *Phytophthora* root rot diseases of Lawson cypress and other ornamentals. Oregon Agricultural Experiment Station Bulletin 537.
2. Tucker, C. M., and J. A. Milbrath. Root rot of *Chamaecyparis* caused by a species of *Phytophthora*. Mycologia 34: 94-103. 1942.

✓ ✓ ✓

The National Trust for Scotland is again organizing an eight-day Spring Garden Cruise, in the Norwegian motorship *Meteor,* starting from Androssan in southwest Scotland, May 3, 1958.

This will visit eight famous gardens, three in northwest Ireland, the remainder along the west coast or on the Scottish Islands. It offers an unique opportunity to see an immense variety of rhododendrons and other plants in their prime. Mr. E. H. M. Cox and Dr. J. M. Cowan will be on board. Charges range approximately from $172 to $427, according to accommodation desired. Further information can be obtained from the Arboretum, but reservations should be made at once through the Organizing Secretary, the National Trust for Scotland, 5 Charlotte Square, Edinburgh 2, Scotland.

Annual Report of Arboretum Units

October 30, 1957

Mrs. Frank Calvert, *Chairman*

THE fiscal year of the Arboretum Units runs from June 1 to May 31, while the fiscal year of the Arboretum Foundation covers the period of September 1 to August 31; therefore there will be an overlapping in this report. Mrs. Wendell Trosper's report for the period of June, 1956, through May, 1957, when she completed the second year of her term as Chairman, is included in the following information.

Membership

June 1, 1956—May 31, 1957.
158 new Unit members.
June 1, 1957—October 30, 1957.
70 new Unit members.
(This brings our total Unit membership to 1200)

New Units Formed

No. 17—Angleworms
No. 24—Edith Banghart
No. 44—Phoebe Thompson
No. 60—Ericaceae
No. 19—Maud Sawyer

Additional units are in the process of formation in Woodinville, Mercer Island, Washington Park, Innis Arden, Laurelhurst and West Seattle. District Representatives have been appointed for the entire area. They meet regularly with Chairmen and Program Chairmen of units in their districts, thus promoting closer contact with the Unit Council. Mrs. Lloyd Adler is Membership Chairman, Mrs. John Schwager, Assistant Chairman.

On September 26, 1957, our first All-City Open House was held in the Arboretum Clubhouse, a most successful event. Over 100 persons attended, despite unfavorable weather. Mrs. Conner Gray, Jr., assembled a portfolio including the brochure "This Is Our Arboretum," *Unit Quarterly News,* folder including map, Calendar of Events in the Arboretum, prepared by Mrs. Wm. E. Ross, and information on Propagation by Seeds and Cuttings. This material was given each visitor and additional copies are available in the Arboretum office.

Visitors were taken on a tour through the offices, library and greenhouses. Mr. L. J. Michaud gave a complete demonstration of propagation by cuttings which virtually stole the show. Tea was served in the Clubhouse against a background of fall color displays provided by Mr. Witt, who was present during the day to answer queries.

Unit Council Programs

Unit Council Programs, held four times during each year, included:

September 20, 1956—Miss Margaret Watt, "Herbs."
January 17, 1957—Mr. Glen Hunt, "Garden Architecture."
March 21, 1957—Mrs. Brian Mulligan, "Native Plants."
May 16, 1957—Tour through Rhododendrons guided by Mr. Witt.
September 19, 1957—Mrs. Edward B. Cole, "Color and Planting Combinations."

Study Courses

Mrs. Roy Anderson worked out a fine study course for the 1956-57 season. Three demonstrations by Mr. L. J. Michaud on propagation by cuttings, grafts and seeds; Mr. J. A. Witt lectured on Native Plant Material and How to Grow Native Materials, and Mr. Glen Hunt on How to Use Native Plant Material.

In February, Mrs. Page Ballard began her informative and entertaining lectures on "Botany for Beginners," working from mimeographed outlines and quiz sheets with outlines of seeds, flowers, fruits, leaves, twigs, etc. She has simplified her large store of knowledge and research material to project a course in Botany for the working gardener, and the results were so successful that she has increased the number of classes from six last year to twenty-four during 1957-58. Classes are free to Foundation members ex-

cept for a small fee for material. A moderate charge is made to non-members. Mrs. Ballard is our Research Chairman.

Mrs. J. A. Ogle, Study Course Chairman, also has arranged for a series of four lectures by Mrs. Wendell Brazeau during 1957-58. Free to Arboretum Foundation members, a small fee for non-members.

Unit Programs

Mrs. H. F. McNiven has compiled a large speakers' list based on subject, fee, if any, season and time available. She has met with program chairmen and is available at all times for help. Member-participation in programs has been greatly encouraged.

Public Relations

Mrs. Wm. E. Ross, Chairman, prepared a complete calendar of Unit activities throughout the year. Activities for daily papers are channeled by her to Mrs. John Finley; publicity for district papers is sent directly by the units.

Mrs. Wendell Trosper has worked with Mr. Bill Moshier of KOMO-TV on his 5:30 p. m. Saturday program featuring the Arboretum. Mr. Witt has appeared on a number of these programs, also Mrs. Wendell Brazeau. Mr. Mulligan and Mr. Michaud presented an excellent demonstration of propagation by cuttings on KING Community Workshop, September 5, 1957.

Horticulture

Mrs. Karl Ellerbeck, Chairman, presents specimen of flowering branches, fruits and leaves to Arboretum Council meetings. She also serves as liaison between units and Mr. Mulligan, to assist units to find projects to help the Arboretum and increase their knowledge of activities.

Other Achievements

Enlargement of office by Mr. Henrik Anderson was completed in October, 1956, under direction of Mrs. Leonard Wilcox. Cost was only $2,487.16, the full amount paid from Unit Treasury. Rhododendron paintings purchased the previous year were framed and hung in the Arboretum Foundation office.

Mrs. Wilcox was chairman of "Work and Fun Day," May 1, 1957. Approximately 250 workers assisted. Unit No. 65 — Grandmothers' Unit—sponsored Chuck Wagon and Comfort Station. Their enthusiasm is attested by the fact that they have agreed to repeat next "Work and Fun Day," April 16, 1958. Mrs. Robert LaBow is chairman.

Temporary By-laws for the Unit Council were compiled with great care and much hard work by Mrs. Joseph Danz and her committee. Approved by Unit Council Board April 7, 1957. Board is now on a rotating basis, officers and chairmen of standing committees elected for terms of two years.

Thanks to Mrs. Wilcox and her committee, the Building and Grounds Department of the University of Washington has increased the heating unit to provide heat simultaneously to the greenhouses, offices and clubhouse. Previously, heating the clubhouse automatically diminished the heat in the other units.

Many units have contributed other than financially by working in certain sections of the Arboretum, donating funds for plants or books, and acting as hostesses during Rhododendron Week of May 13, 1957. Mrs. Harry Slater contributed greatly in our public relations field as chairman of our 1956 Fall Color tour, with the West Seattle units sponsoring the coffee hour in the Clubhouse.

Unit No. 65 gave four benches and sold eight benches to other units, to be placed throughout the Arboretum grounds. Mrs. Jack Perine arranged for permanent help for cleaning the clubhouse, and worked out a slightly increased schedule of rentals so that income will offset cost of maintenance.

Arboretum Unit Council
Financial Statement

Balance on hand May 1, 1957	$2,025.72
The largest donation from this fund to the Arboretum was $1,400.00 for additional help for Mr. Mulligan this past summer.	
Income during September, 1957, and October to date includes:	
Net return from Plant Sale, 10/10/57	1,892.68
Approximate net return from fees for Mrs. Ballard's Botany Classes	150.00
Balance on hand 10/30/57	$2,587.85

The Arboretum Bulletin

Vol. XX, No. 4 Seattle, Wash. Winter, 1957

ARBORETUM FOUNDATION
OFFICE HOURS
9 a. m. to 4:30 p. m.
Monday through Friday
Phone MInor 4510

ARBORETUM FOUNDATION OFFICERS

Edward B. Dunn, *President*
Dr. Walter A. Moore, *Vice-President*
Philip W. Bailey, *Vice-President*
Mrs. Page H. Ballard, *Vice-President*
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Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and The Bulletin will be discontinued.

Arboretum Membership Blank

☐ Active	$ 5.00
☐ Contributing	10.00
☐ Supporting	25.00
☐ Sustaining	50.00
☐ Sponsor	100.00
☐ Life	500.00
☐ Endowment	1,000.00
☐ Affiliated Garden Clubs and other organizations	10.00

The Arboretum Foundation,
University of Washington Arboretum
Seattle 5, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name .....

Address .....

All memberships are non-assessable.

Notes and Comment

We are pleased to welcome the following new members to the Arboretum Foundation (September 1 to December 1, 1957):

Mrs. John E. Allingham, Mrs Charles M. Anderson, Mrs. Andrew Bakun, Jr., Mrs. David R. Bath, Mrs. Richard Becker, Mrs. D. F. Bourassa, Mr. and Mrs. Wilfred T. Brown, Mrs. William S. Bucknall, Mrs. Lyle C. Burwell, Mrs. J. R. Carnwath, Mrs. Paul Chase, Mrs. Ward H. Clarke, Mrs. Charles F. Clise, Jr., John Stewart Detlie, Mrs. Warren L. Dewar, Mrs. Leon R. Diers, Jr., Mrs. Jack Doctor, Mrs. Lewis Dowell, Mrs. Rush S. Drake, Miss Joanne Eckstein, Mrs. Lynn Elder, Mrs. Robert C. Ellis, Mrs. C. W. Fitton, Mrs. A. K. Free, Mrs. David T. Galbraith, Joseph E. Gandy, Mrs. Richard A. Gardner, Mrs. H. J. Garretson, Jr., Mr. and Mrs. Martin B. Geary, Mrs. R. O. Gepner, Mrs. W. H. Gronenthal, Mrs. Paul N. Gustin, May B. Guy, M.D., Mrs. E. Rowland Hagyard, Mrs. Howard J. Hammond, Mrs. Daniel Harris, Mrs. Wendell R. Hayward, Mrs. Wylie Hemphill, Jr., Mrs. J. E. Hertzberg, Mrs. George W. Hettrick, Mrs. T. P. Higgins, Mrs. Frank Holert, Mrs. O. Jacobsen, Mrs. David B. Jones, Mrs. Louis C. Kathrein, Mrs. Frank R. Kitchell, Jr., Mrs. Edward J. Krause, Mrs. Glen H. Krueger, Mrs. Walter H. LaFond, Mrs. William M. Landin, Mrs. Robert Lavallee, Mrs. E. Harold Laws, Miss Jean Lawson, Mrs. Gerald Layton, Mrs. Harold J. Liptack, Mrs. Charles H. Lotz, Mrs. Kenneth G. Maas, Mrs. Ronald A. Macdonald, Mrs. P. D. Mackie, Jr., Maurice Mandell, Mrs. M. L. Maxum, Mrs. Willard McGary, J. A. McKinnon, Mrs. Robert C. McRae, Mrs. Wesley Mifflin, Jr., Mrs. Joseph E. Miller, Mrs. E. J. Mills, Mrs. Fred Minahan, Mrs. Roy W. Morse, Mrs. E. A. Mount, Mrs. Herman P. Muto, Mrs. Howard M. Nimmons, Mrs. Fred J. O'Brien, Philip S. Padelford, Mrs. Alex Paterson, Mrs. Frederick Paul, Mrs. Wayne D. Pennington, Mrs. David T. Powell, Mrs. Fred W. Richardson, Mrs. Richard Rouzie, Mrs. Paul W. Seibert, Mrs.

Dan Setchfield, Mrs. Jason R. Smith, Mrs. Robert S. Spears, Mrs. R. K. Steele, Mrs. Ira Swisher, Mrs. Wayne F. Taylor, Mrs. Roy C. Tenney, Mrs. Thomas Thornton, Mrs. William F. Tiemeyer, Mrs. Leo S. Trask, Mrs. Gerald Ummel, Mrs. Reino Valli, Mrs. James Versoi, Mrs. G. R. Viereck, Mrs. F. E. Wamba, Mrs. George W. Welch, Mrs. Robert West and the Capitol District of the Washington State Federation of Garden Clubs, the Laurelhurst Park Garden Club, Richmond Beach Garden Club and Sand Point Garden Club.

At the Annual Membership Meeting held October 30, the following officers of the Foundation were elected for the year 1957-1958: Edward B. Dunn, President; Dr. Walter A. Moore, Philip W. Bailey and Mrs. Page H. Ballard, Vice-Presidents; Roscoe Drummond, Treasurer, and Mrs. W. Kirby Holmes, Secretary.

Newly elected to the Board of Directors were: John A. Blethen, John S. Detlie, Joseph E. Gandy, Mrs. Donald G. Graham, Mrs. John H. Hauberg, Jr., Mrs. Alexander Hepler, Pendleton Miller, Philip Padelford, Mrs. Rex Palmer, D. E. Skinner and Mrs. Frank N. Brooks of Bellingham.

The following Directors were re-elected: Cebert Baillargeon, Mrs. J. Swift Baker, Carl M. Ballard, Mrs. Carl M. Ballard, Prentice Bloedel, Mrs. Prentice Bloedel, Mrs. Lawrence Bogle, Mrs. Frederick A. Bunge, Mrs. Frank Calvert, Mrs. William Calvert, Mrs. John A. Clark, Mrs. Caspar W. Clarke, Mrs. J. Thomas Dowling, Mrs. Allen B. Engle, Mrs. Henry C. Field, Mrs. Richard E. Fuller, Edward I. Garrett, Donald G. Graham, Mrs. Mansel P. Griffiths, Mrs. Loren Grinstead, Mrs. Neil Haig, Clinton S. Harley, Mrs. Langdon C. Henry, Dr. Jackson K. Holloway, Albert F. Hull, Mrs. Henry C. Isaacson, Mrs. Mark Jensen, Mrs. Arthur J. Krauss, C. B. Lindeman, Mrs. Philip Macbride, Dean Gordon Marckworth, Roy L. Maryatt, Donald K. McClure, Mrs. Alexander McEwan, Miss Anne McFee, Dr. A. H. Meadowcroft, Mrs.

(Continued on Inside Back Cover)

Traffic Count Results 1956 - 1957

ON Thursday, October 12, 1956, a traffic counter was placed at the north end of Arboretum Drive North, just west of the clubhouse. The count was taken daily for one week and again for one week out of each month for the next year. Unfortunately, no figures were available during January and February because of malfunction of the counter or deep snow.

During the ten weeks in which traffic was counted, we registered a total of 27,661 cars. By projecting this figure to cover the whole year we find that approximately 128,000 cars passed our counting station during the twelve-month period. Of course, not all these were primarily interested in the Arboretum, as we know that the road is often used as a short cut, and our own service vehicles are usually counted several times a day. However, these are well in the minority and may be discounted. If we assume an average figure of two persons per car we then arrive at a total of over 250,000 people driving through the Arboretum each year. This doesn't include any count of pedestrian traffic, which is rather considerable, and must bring the total number of visitors much higher.

An examination of the monthly counts reveals, as might be expected, that the greatest amount of traffic occurs in March and April, with May following closely. In fact, these three months account for over half of the total year's traffic. June, July and August had about one-fourth, with the remaining six months having the final fourth.

The daily figures indicated that we had our heaviest traffic on the weekend, as, of course, we already knew. We found that approximately 34 per cent of the visitors came on Sunday, 16 per cent on Saturday and 10 per cent on each of the weekdays. It was interesting to note that as the traffic increased, the percentage of visitors who came on the

(Continued on Page 154)

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

Garden Hints

JANUARY

More and more gardeners are leaning toward those gardens where foliage is the predominant interest. A walk through the Arboretum in winter when no blooms can be seen gives a satisfaction hard to describe. Since we really have no "off-season" in our climate it is one of our pleasures to make the winter garden lovely. There are a number of conifers that become "winter gold" as the cold weather approaches. The little pine, *Pinus sylvestris aurea,* seldom reaches over six or eight feet and is a charming copperish color. *Cupressus macrocarpa lutea* is another yellowish conifer but not quite as dramatic —or as hardy—as the first named. Trees chosen for their brightly colored bark also make beautiful ornamental accents. Shrubs with berries not particularly preferred by the birds often make graceful sprays. *Cotoneaster pannosa* and *C. serotina*—both evergreen—have bunches of bright red berries that often remain until spring. *Arbutus Unedo* and the Pernettyas are high and low shrubs. One grey foliage plant, *Santolina incana,* is a highlight at any time, winter or summer.

Some transplanting of trees may be done in January if the weather is mild. Also, according to the weather, it may be well to stake the trees until they are established.

The new annuals are becoming so wonderful that they are taking many places where we have previously planted perennials. Consequently much of our fall work may be delayed until spring. The soil should be cultivated just before sowing the seed.

In the rose bed, before planting the rose bushes, work in some of the new rose fertilizers.

FEBRUARY

Besides the heather, February flowering shrubs are few. *Azara microphylla* has tiny yellow blooms and while not conspicuous, they are very fragrant. The shrub has a neat, box-like appearance and it is used as a low hedge very successfully.

Elaeagnus angustifolia with silvery-white, narrow, willow-shaped leaves is almost flower-like in its effect when well placed.

Rhododendron "Christmas Cheer" is in bloom in February. This year there were many blossoms of "Christmas Cheer" in bloom early in November. Our dry summer did many strange things in the Arboretum this year.

Mahonia Bealei is one of the most noteworthy in the whole list of Mahonias. The foliage is distinctive and the flowering racemes are lemon-yellow, long and conspicuous. It is one of the best of all winter-flowering shrubs. It came originally from China.

It is interesting to study a whole family of plants, as Mrs. Page Ballard is doing. Her study of the Ericaceae family will remain a life's pleasure. There are many other families not so extensive, such as the shrubby spiraeas, the sedums or the campanulas. There is a great joy knowing a family well.

February awakens most of the catkin bearers. Hazel bushes are among the first and most beautiful. *Garrya elliptica* and the Japanese *Stachyurus praecox* are both exceedingly elegant in February.

Cornus mas, one of the oldest cultivated plants it is said, is showing its tiny yellow umbels and it is a real pleasure to meet them again.

MARCH

There are many signs of spring in March. The garden shows various activities. One of the greatest pleasures is to find the plants and shrubs that have come through the winter successfully.

All rock plants will move well in March. Most of them do not require a rich soil but

they like a new soil, one that has not been used before. Some of them like a bit of peat and others like a little lime. Knowing your plants' likes and dislikes is very important.

The rose bed is one of the vital spots in March. New plants may be planted, old plants may be pruned. Remember the harder the pruning the stronger the resulting growth and finer flowers.

Raising bulbous plants from seeds is one of the successful industries on the west coast today. Many of the newer lilies have come from home grown seeds and the crossing of blooms may become an enthusiastic enterprise. Sow the seeds in rows in any good soil and it doesn't take the patience of Job to wait for the new blooms.

The Hellebores all withstood the "big freeze" of two years ago which make them especially precious in everyone's gardens. They seem to flourish in most areas; some, indeed, grow well in fairly sunny spots.

If there is a garden that has not a planting of Lithospermum I suggest it as a plant of great value. It is amiable and in my garden it paid its rent twelve months of the year. The variety *L. prostratum* "Heavenly Blue," has, eventually, large mats of color. A rockery or any sunny border without it is lacking a distinctive and distinguished plant. It is not rare nor is it particular in its likes or dislikes.

From Our Correspondents

To the Editor of the Arboretum Notebook:

The excitement of finding seedlings under a heavy shrub is one of the dividends of gardening, but this joy is not for those who carefully remove every flower before it can go to seed, and who keep the soil under their plants bare and clean. In our woodland we have found that an undercovering of moss (or a rotting log) is a natural seedbed for rhododendrons. Our most welcome discovery this year was two seedlings of *Rhododendron pholidotum* which were thriving close to the spot where the parent plant had given up the ghost after November, 1955. These progeny of a "lost shrub" almost anti-climaxed the finding of more than a dozen seedlings of *R. caesium,* another casualty of 1955, though its injuries were not fatal. Other natural seedlings were *R. Keiskei, Menziesia lasiophylla* and *M. ferruginea,* as well as several that give promise of being natural hybrids between the Japanese and W. American menziesias. So let's think twice before we nip off every fading flower, and let's practice a bit of judicial neglect.

Fanatically yours,
A Horticultural Heretic

List of Plant Names

(Continued from Spring, 1957)

thebaicus	of Thebes
theifera	tea-bearing
Thelesperma	Gr., nipple seed
Theobroma	Gr., food of the Gods
thermalis	of warm places
Thermopsis	Gr., lupin and like
Thespesia	Gr., divine
Thevetia	for Andre Thevet, French monk
thibeticus	of Tibet
Thlaspi	ancient Gr. name
Thuja	ancient Gr. name, from thuo, to smell
Thujopsis	Gr., Thuja-like
Thunbergia	for Carl Peter Thunberg, Swedish botanist
Thunia	for Count Thun-Tetschen
thurifera	incense-bearing
thymifolius	thyme-leaved
thymoides	thyme-like
Thymus	old Gr. name
thyrsiflorus	bearing flowers in a thyrse
Thysanotus	Gr., fringed
Tiarella	Lat., a little tiara
Tibouchina	native name in Guiana
Tigridia	tiger-like
tigrinus	striped like a tiger
Tilia	classical Lat. name for linden tree
tiliaceus	Tilia or linden-like
tiliaefolius	Tilia-leaved
Tillandsia	for Elias Tillands, Swedish botanist
timeteum	to be honored
Tinantia	for Francois Tinant of Luxemburg
tinctorius	of or belonging to dyers
tinctus	dyed
tingitanus	of Tangiers
tipuliformis	shape of a daddy-long-legs
titanus	very large, like a Titan
Tithonia	from mythological name Tithonus
Tolmiea	for Dr. W. F. Tolmie, surgeon and plant collector
tomentosus	tomentose, densely woolly
tonsus	clipt, sheared

Torenia	for Olaf Toren, Swedish clergyman
torminalis	useful against colic
torosus	cylindrical with contractions
torquatum	wearing a necklace
Torreya	for Dr. John Torrey, 1796-1873
tortifolius	leaves twisted
tortilis	twisted
tortuosus	much twisted
torulosus	diminutive form of *torosus*
tosaense	from Tosa, Japan
Townsendia	for David Townsend, botanist in Pennsylvania
toxicarius	poisonous
toxifera	poison-producing
Trachelium	Gr., trachelos, neck
Trachelospermum	Gr., neck and seed
Trachycarpus	Gr., rough fruit
Trachymene	Gr., rough membrane
trachyspermus	rough-seeded
Tradescantia	for John Tradescant, gardener to Charles I of England
Tragopogon	Gr. for goat's beard
Traillianum	for Prof. Traill of Aberdeen, Scotland
translucens	allowing transmission of light
transparens	clear, like glass
transsylvanicus	of Transylvania
Trapa	abbreviated from calcitrapa, Caltrop
trapezoides	with four unequal sides
Trautvetteria	for E. R. von Trautvetter, Russian botanist
tremuloides	like tremulus, the trembling poplar
tremulus	quivering, trembling
Trevesia	for the family of Treves di Bonfigli, of Padua
triacanthophorus	bearing three spines
triacanthus	three spined
triandrus	with three anthers or stamens
triangularis	three-angled
trichocalyx	with a hairy calyx
trichocladum	hairy twigs
trichocarpus	hairy-fruited
Tricholaena	Gr., hair and cloak
trichomanefolius	Trichomanes-leaved
trichomanoides	Trichomanes-like
trichophorum	bearing hairs
trichophyllus	hairy-leaved
Trichopilia	Gr., hair and cap
Trichosanthes	Gr., hair and flower
Trichosporum	Gr., hair and seed
Trichostema	Gr., hair and stamen
trichospermus	Gr., hairy-seeded
trichostomum	hairy-mouthed
tricoccus	three-berried
tricolor	three-colored
tricornis	three-horned
tricuspidatus	having three points
Tricyrtis	Gr., three convex, referring to petals
tridactylus	three-fingered
tridens	three-toothed
Trientalis	Lat., one-third of a foot high
trifasciatus	three-banded
trifidus	three-parted
triflorum	three-flowered
trifoliatus	three-leaved
trifoliolatus	of three leaflets
trifurcatus	three-forked
Trigonella	Lat., a little triangle
trigynum	with three styles
trilineatus	three-lines
Trilisa	anagram of Liatris
Trillium	Lat., trilix, triple, or tres, three
trilobatus	three-lobed
trimestris	of three months
trinervis	three-nerved
trinotatus	three-marked or spotted
triornithophorus	bearing three birds
Triosteum	Gr., three bony seeds

(To Be Continued)

Traffic Count Results, 1956-1957

(Continued from Page 151)

weekends increased. For example: in September there was a total of 7,970 cars of which 42 per cent visited us on the weekends; in April there were 23,950 cars, 62 per cent of them counted on Saturdays and Sundays. This trend is found throughout the rest of the year and indicates that when we get an increase in visitors, we must expect the majority to come on Sunday — reason enough to keep our office open then.

Below are the monthly totals for the ten months counted in 1956-1957.

1956	October	6,590
	November	3,510
	December	3,320
1957	March	20,440
	April	23,950
	May	17,600
	June	14,550
	July	11,700
	August	11,650
	September	7,970
	Total	121,280
	*Total for the year	128,000

Highest day count, 2,351 on Sunday, April 21.

Lowest day count, 61 on Sunday, November 17.

We realize that these figures are open to error from several sources, but they do indicate trends and give us the first concrete figures on the number of Arboretum visitors yearly. The counting will be continued and should provide even more usable figures in the future.

*Estimated by using December, 1956, figures for January and February, 1957.

J. A.W.

BOOK REVIEWS

Handbook of Hollies, National Horticultural Magazine, Special Issue, Jan., 1957. (Washington, D. C.). Price $3.00.

YOU who choose to walk among the hollies will discover an intriguing trail well marked by those for whom the hollies have held great appeal. Along this adventuresome pathway will be found many a milestone marker erected down through the years to assist both student and novice, the better to know and appreciate all of the many and varied hollies of the world. Every now and then a revealing treatise of monumental proportions has been produced by an author who has chosen to impart his zest for and devotion to the hollies to those who search for light on the subject. Such famous names as Thomas Moore, W. Dallimore and Dr. H. Harold Hume fall within this category of literary luminaries.

Now comes a long-awaited collection of informative articles all contributing to the science and knowledge of the hollies, written by an imposing array of contemporary authorities collaborating under the able direction of Editor Harry Dengler. It is aptly named "Handbook of the Hollies" and has been published in 1957 as volume 36 of *The National Horticultural Magazine* at Washington, D. C. The newborn Handbook brings within easy reach of the casual visitor to the realm of the hollies an authoritative and useful guide, a splendid supplement to the noteworthy literature relating to the hollies. It will serve to fairly propel the gentle reader into the entire world of holly lore and history and a botanical excursion sparkling with interest. The Handbook will erase much of the previous need for tedious searching and the unearthing of scattered and piecemeal writings extant on the subject of the hollies.

For the casual reader or gardener who possesses the urge to penetrate into the whys and wherefores of the plant world about him the Holly Handbook will prove to be a veritable compendium of comprehensive material. There is an old Spanish proverb which reads, "He who would bring home the wealth of the Indies must carry the wealth of the Indies with him." And, paraphrasing Samuel Johnson, "So it is with walking among the hollies, one must carry knowledge with him if he would bring home knowledge." Surely one's appreciation of the hollies cannot but be enhanced by a reading and study of the Handbook.

As with all books of reference, which are limited in continuity, the Handbook does not have to be read in the order of the table of contents to be enjoyed. In fact, some chapters of rather technical material, prepared by orderly-minded scholars who have a penchant for seeking a place for everything and then putting everything in its proper place, will have especial appeal for the more serious students of botany and its allied fields of horticulture, dendrology, etc.

Garden club enthusiasts and program chairmen will find much to delight them in the chapter on Holly Folklore and Legends which have come down from the dawn of man and are arrestingly retold by Editor Harry Dengler. Helpful hints and procedures for the propagation and culture of the hollies will attract many a reader who would like to learn more about the proper way to grow the holly beautiful. Chapters on the use of hollies for better landscaping effects, or as screens and sound barriers, have been helpfully prepared for the guidance of the home gardener.

Other sections of the Holly Manual are devoted to the growing of holly commercially, to be cut for colorful decorations at the Christmas season. This unique and specialized orcharding is limited at present to the coastal areas of the United States, where fairly equable temperatures obtain. Those tempted to invest in a commercial grove of holly will do well to equip themselves in advance with all available information relative to marketable species and varieties, likely locations for a successful operation and more than a superficial knowledge of cultural and marketing problems. Much useful, fundamental and I wish to add unbiased information is presented in the Holly Handbook.

Finally, for the housewife herself, who loves to decorate her home with attractive arrangements of flowers and greens, there's a delightfully illustrated treatment of this creative art by professional experts. Other specialty subjects such as Japanese bonsai art as applied to the artificial dwarfing of the hollies, and tree sculpture or topiary art as practiced with the hollies, are well covered with illustrations and explanation.

Presuming that it becomes the privilege of a book reviewer to assume the role of critic, may I express the hope that the Holly Handbook will serve as forerunner to an even more complete treatment of the entire fascinating subject material so profusely available to the scholar and yet hidden away in large part in the archives of botanical libraries, and in the transient writings of freelance researchers which appear periodically in current magazines and newspapers. With the advent of less expensive color reproduction processes it is to be hoped that future works of this magnitude and general interest can be illustrated throughout in full color.

A further thought which I offer with most constructive intent is that a future encyclopedic coverage of the subject of hollies be issued in more than a single volume.

It is probable that a volume of holly information limited to subject material with popular appeal to the amateur gardener and home owner would have wider distribution and result in a greater public appreciation of the hollies of the world than could be gained by merely enlarging the present version of the Handbook. A separate book could well be written on "Commercial Holly Growing in the United States." For the student of the hollies of the world, nothing less than a full volume and one well supplemented with a glossary of botanical terminology would be required to do justice to this technical subject material. Other chapters deserving of more complete treatment in the future might well be entitled: Holly Folklore and the Story of Christmas Holly; The Medicinal Hollies; Hy-

bridizing Hollies and Techniques of Propagation.

In summation I would like, as a lifelong enthusiast and student of the hollies, to salute the current Handbook as being a most noteworthy contribution to the literature of the Hollies of the World. I predict that its pages will stimulate much further observation and study of the hollies coupled with future writings of import. There has been far too large a hiatus between the works of Dallimore and Hume. May the Holly Society of America, the National Horticultural Society and the contributors to the Handbook of the Hollies receive well deserved encomiums of praise and many encouraging responses from the readers for a timely work well done.

AMBROSE BROWNELL

Australian Tree Portraits, by Chas. P. Mountford, with sketches by Miss Glen Walsh. Victoria, Melbourne Univ. Press; 1956. Price, $8.50.

ANYONE whose interest in trees extends to an appreciation of the technical excellence of forest photography will enjoy this volume. Although the thirty species illustrated and described are not familiar to us in the Pacific Northwest, the very excellent photos—representing a selection from many negatives taken over a long period—embody a feeling for the type of arboreal interest one encounters "down under." Each fine photo is enhanced by an interesting description of the species pictured and several black and white sketches of foliage, flower and fruit.

C. FRANK BROCKMAN

The Camellia, Edited by Beryl Leslie Urquhart; 55 pp. plus 20 colored plates, by Paul Jones and Raymond Booth. (The Leslie Urquhart Press, Sharpthorne, Sussex, England.) $10.50 plus postage.

THIS is a large book. Its accent is on pictures rather than on reading matter. The reproduction of some twenty paintings is quite good for the most part, although several are not true to color. However, most of the paintings are really outstanding and the reproduction has been skillfully done. Apparently the editor has at her disposal the facilities of a modern color press.

The introduction states:

"This book is intended to be the first of a series of volumes on the Camellia and the purpose of the work is to make available to those of moderate means a series of flower books of artistic merit and literary interest with a dominant emphasis on accuracy in both text and illustrations.

"It is offered as a contribution to the efforts now being made to bring some order into the existing confusion in camellia names and synonyms and at the same time to furnish a dependable means of comparison which will also form a 'yardstick' against which can be measured the quality of new introductions."

The selection of the twenty camellias described and illustrated in this book was apparently determined by the personal taste of the editor. Two of the varieties are local to Portugal and one to Australia. So far as is known, these, together with three others, are not commercially available in this country. Some of the other varieties selected are outstanding camellias such as Donckelarii, Adolphe Audusson, Elegans, Mathotiana (called Grand Sultan in this book). However, I personally question the inclusion of Pink Perfection (called Frau Minna Seidel), and Tricolor. I think most camellia fanciers in this country feel that other and newer varieties have outclassed them in their particular classifications. The inclusion of *Camellia sinensis (C. Thea)*, which has no garden value, was apparently for historical interest.

However much one may disagree with the editor's selection of varieties, she has done a commendable job in tracing the origin and the first official publication of names of these camellias. I am not one who believes in changing names in common use to conform to rules. This, of course, is rank heresy to a botanist but, frankly, I do not favor introducing additional confusion into the already complicated camellia nomenclature by poring over camellia books and nursery catalogs over a hundred years old in an attempt to establish that such a well-known and universally liked variety as Mathotiana must now be called Grand Sultan. Furthermore, I will still call my beautiful white semi-double camellia Sodegakushi, and not Gauntletti.

Mrs. Urquhart has provided a beautiful book. It would cost at least twice as much if produced in this country. To a keen camellia grower it will be a welcome addition to the library. However, it does not contain cultural information and it should be bought simply for what it really is, some beautiful pictures and some historical data on twenty camellias which apparently hold especial appeal to the editor. American purchasers will want, but probably in vain, to buy several of the camellias illustrated. Perhaps Mrs. Urquhart, if asked, would tell them where they can be obtained.

DONALD G. GRAHAM

Coniferes D'Ornement, by V. Chaudun, du Museum National d'Histoire Naturelle, Secretaire du Comite d'Horticulture d'Ornement et Dendrologie de la Societe Nationale d'Horticulture de France. La Maison Rustique, Paris, (1956). Price, in U. S. A., $3.25.

THIS is one of the series of Golden Nature Books, "Livres d'Or de la Nature." If the other books in the series are as good as this one, we could wish them all to be available in English. Mrs. Vera Higgins has done a translation, published by Crosby Lockwood of London, 1956, 17 shillings, or $3.50 here. Of small compass, 156 pages, excellent print, many photographs, in both black and color with a practical hard-back cover, it is an astonishingly compact reference book and guide to the conifers. It is well indexed and in addition there is a glossary of botanical terms that might be a problem for those to whom the author refers as "les profanes," the less than well informed.

After a brief reference to the origin of the

name "Conifers" bestowed on them by the naturalist Belon in the sixteenth century, M. Chaudun expresses the hope that his small book may be of particular use to the landscape gardener, the informed amateur and those wishing to become so.

Conifers are then considered under the headings of History, Importance, Culture, Soil Preparation, and Propagation by Seeding, Slipping and Grafting. Folowing this, there is a discussion, written with the same terse clarity, on the choice of ornamental conifers in respect to terrain, height, color and suitability to various garden sites.

The manual is completed by an alphabetical listing of all the genera and under each the species of the various conifers. Along with the name of the genus there is a brief botanical description of that group; with each species is given the name of the person by whom the plant was first described under this heading, with a fairly detailed description of its habitat and particular characteristics.

H. M. G.

Plants and Gardens—Summer 1957. Vol. 13, No. 2; Handbook On Propagation.

THE quarterly published by Brooklyn Botanic Garden and called *Plants and Gardens* has earned an enviable reputation for the trustworthy and authoritative completeness with which each subject is treated. The Summer 1957 issue devotes all of its pages to articles on the propagation of plants.

All the ramifications of the subject receive excellent coverage by competent writers. Seeds, cuttings and grafts are discussed in detail. Unusual subjects include *Using Plastics in Propagation* by George Taloumis, *Difficult Seeds* by Fred C. Galle, and *Propagating House Plants by Cuttings* by Kathryn S. Taylor.

Illustrations complement the test to make each idea clear. A two-page list of reference books, compiled by Viola Briner, further increases the value of an already packed handbook.

This issue becomes a readable manual to encourage the new gardener to try one or more types of plant propagation and to inspire the old gardener to improved methods.

If one is not already a subscriber to *Plants and Gardens* this one number would be worth more to him than a whole year's cost ($2.00). The editors and the contributors are to be congratulated on its success.

FRANCES KINNE ROBERSON

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Trees and Shrubs for Exposed Situations on California Coast

(Continued from Page 139)

Cryptomeria japonica, Fagus, larch *(Larix europaea),* Liquidambar, Nothofagus, *Picea Smithiana, Pinus canariensis, P. Montezumae, P. patula,* Populus, Japanese umbrella pine *(Sciadopitys verticillata),* and many magnolias, in local less fully exposed gardens, along with our beloved native redwood, *Sequoia sempervirens.*

Cornus capitata is one tree which we dare not overlook. It is from the Himalayas, evergreen, covered with greenish-yellow flowers, and followed by enormous strawberry red fruits, so numerous and so heavy that the laden branches bend almost to the ground. It stands full exposure here.

Finally we must mention the genera Eucalyptus and Pittosporum. Many of the Eucalyptus will stand full exposure here. Between Eureka and Arcata, California, there is a pruned windbreak of *E. globulus* along Highway 101 in full exposure. It should be noted that the larger-growing Eucalyptus droop to the ground and have less breakage when they are heavily pruned every year or two in the Fall.

Those standing full exposure are *E. coccifera, E. ficifolia, E. globulus, E. Gunnii, E. leucoxylon, E. polyanthemos, E. pulverulenta, E. sideroxylon, E. viminalis.* These are very rapid growers. We are also trying to grow other species here, including *E. caesia, E. citriodora, E. diptera, E. erythrocorys, E. Lehmannii, E. macrocarpa* and *E. niphophila.*

Pittosporum crassifolium, P. eugenioides, P. tenuifolium, P. Tobira and *P. undulatum* all stand full exposure either as specimens, as windbreaks or as clipped hedges.

The writer of this article lays no claim to completeness but he hopes it will encourage and stimulate further study and experiment to find or produce more and better seaside and coastal-resistant shrubs and trees. For brevity the names of the species grown here of some of the above-mentioned genera had to be omitted.

Wall Shrubs and Climbing Vines

(Continued from Page 142)

LONICERA (Honeysuckle). There are many greatly differing varieties of these wall shrubs. The most popular, perhaps, is the European *L. Periclymenum,* grown particularly for the delicious perfume of its flowers. It is a vigorous and excellent shrub for covering walls, trellis or arbors. The flowers are tubular in shape, produced in terminal heads on a stalk beyond the last pair of leaves. They are large, opening white, turning to straw yellow and are conspicuous against the dense background of its foliage. It is easily grown and absolutely hardy.

PARTHENOCISSUS (Ampelopsis) (Boston Ivy). Very popular woody vines, excellent for covering walls. The almost palm-like leaves add much to the autumn color in the garden. Especially desirable is the charming miniature form—*Lowii*—it is the smallest leaved of the Boston ivies. A quick-climbing, self-clinging vine, whose foliage turns brilliant scarlet in the fall. This charming variety is especially well adapted for use on buildings of fine architectural lines. Close fitting, short stemmed, its effect is tracery-like and does not completely cover the brick or stonework. It is much more charming and desirable than the large-leaved variety *Veitchii.*

POLYGONUM—Silver Lace Vine. A beautiful and dainty vine of rapid growth, suitable for porch, pergola, fence, or wall cover. Its tiny foliage and masses of small, foamy white flowers in late summer give a fluffy, lacy effect. It is extremely vigorous and will succeed where other vines will not thrive.

TROPAEOLUM. Almost everyone is familiar with the annual varieties of nasturtiums grown in our gardens, the large, handsome orange and scarlet forms and the yellow *Tropaeolum canariensis*—Canary Creeper—but few are as well acquainted with the perennial form, *T. speciosum.* Its foliage is of a vivid green and the flowers a positively dazzling scarlet. Once established, this climber grows from fifteen to twenty feet in a season.

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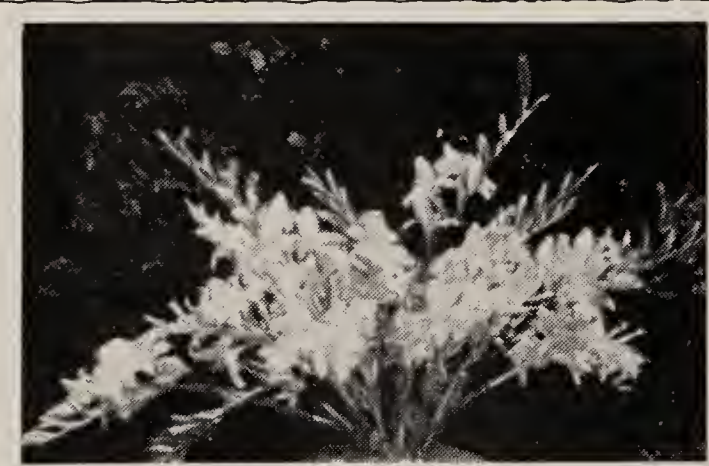

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It is exceedingly graceful and frequently used for draping evergreen shrubs, or grown on wire mesh to form a screen. It will rapidly cover the screen, and present a sheet of brilliant scarlet blossoms in July, followed by electric blue berries. *T. speciosum* is the jewel of the race, the pride and despair of many gardeners. In Scotland it is commonly known as the Scotch Flame Flower and many are the cottages entirely covered with this daintiest and brightest of climbers. It likes a cool, moist, peaty soil, with plenty of leafmould and crumbled, rotted wood. It will grow and flower in full shade but prefers a little sun. An east or north exposure is best. It is well worth any effort to establish this treasure and should you succeed great will be your reward.

VITIS—Grape. The form of the grape leaf has ever been admired, and many landscape designers recommend the planting of wild grapes for their luxuriant foliage alone. They are ornamental on walls or covering a pergola. Some have sweet and edible fruit to add to their charm. One especially lovely form of wild grape is *Vitis Coignetiae,* the Crimson Glory Vine from Japan. It has large, heart-shaped foliage, green above and tinted rose; in fall it deepens in color, eventually becoming brilliant scarlet before falling. *Vitis vinifera purpurea,* the Claret Vine, so called for its vinous purple foliage, becoming richer in color before the leaves fall, is exceedingly handsome.

WISTERIA. Wisterias win all beholders. Their delicate colors and fragrance are the envy of all who do not possess them. The Japanese variety, *Wisteria floribunda* variety *macrobotrys* is especially desirable with its extra long racemes of exquisite purple, mauve, or white flowers. They are beautiful on pergola or lattice work over tiny pools, or on the branches of a tree which reaches out over a lake where the long racemes of flowers droop and create a charming and perfect picture by their reflection in the water below. Ideal conditions for wisterias are well-drained loam, sunshine, and plenty of moisture while in growth.

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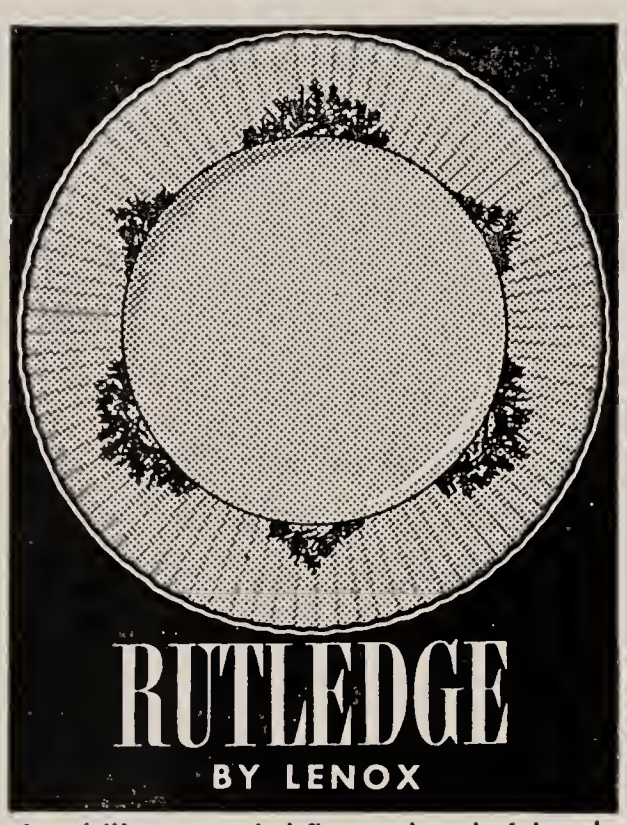

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Shrubs for Northwest Coastal Gardens

(Continued from Page 136)

fragrant, orange-scented flowers, a contrasting white against the glossy dark green leaves. *Photinia serrulata* grows rather coarsely but is good for the back of the border where it can show its coppery new growth most of the summer. The holly-leaved barberry, *Berberis Darwinii,* is beautiful because of its small glossy leaves, but especially because of the bright orange racemes of flowers in spring, and inclined to appear all summer.

The laurels include three types, coarse-leaved but useful. English laurel, *Prunus Laurocerasus,* grows to 20 feet but is often clipped as a hedge. Other species make better hedge plants, except perhaps in the matter of rapid growth. Portugal laurel, *P. lusitanica,* is slower growing and more compact. *P. Laurocerasus Zabeliana* is a dwarfish, very spreading form, useful for covering banks and other purposes.

There are many species and varieties of Ceanothus well adapted to coastal areas in California and a few are useful in Oregon and Washington. We shall probably see more of them used in the future. Skimmia is already widely used. *Daphne odora* forms a sprawling bush most notable for the fragrance of its flowers. *Halimiocistus Sahucii* appears to be a promising ground cover, a very low, spreading evergreen shrub which flowers very freely in early May. The flowers last but a day, but there always seem to be more to take their place the next day.

Two evergreen viburnums are worthy of note. *Viburnum Davidii* has recently come

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into demand because of its knee-high growth and bluish berries. *V. Tinus,* the well-known laurustinus, blooms all winter in the milder areas, a most welcome sight during the grey days of winter.

Brooms and Blueberries

The brooms appear to be evergreen as the twigs are well supplied with chlorophyll, but the tiny leaves may drop. Most are familiar with Scotch broom, *Cytisus scoparius,* naturalized along the coast and somewhat of a weed, but where can you find a better yellow? Some others, mostly dwarfer, are less inclined to seed themselves so freely. *C. praecox* "Moonlight", *C. kewensis,* and some of the red flowered sorts are useful and certainly very easy to grow.

Plants of the cultivated blueberry, in a number of named varieties, can be used very effectively in the border for both fruit and ornament. The flowers are not conspicuous but attractive; the berries quite attractive—unfortunately to birds as well as man. They are not evergreen but put on a good show of autumn coloration, something lacking in many coastal gardens.

Many Other Good Shrubs

This discussion has covered primarily the shrubs with which I have developed some familiarity. There are many more, and more will be provided by plant breeders. Shrub gardens do not require annual planting, tend to keep weed growth down, especially if mulched, and are almost as beautiful in winter as summer. The trend is towards the garden with the least maintenance problems, the shrub garden.

Rhododendron repens hybrids, many new varieties, budded; also Rhodns. imperator, pemakoense and other dwarf and medium growing varieties.

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Some Results of the November, 1955, Freeze

(Continued from Page 131)

Name	Hardiness	Little or No Damage	Up to 50% Defoliated	Over 50% Defoliated	Killed
Pink Pearl	H3	xx	xx	x	
Princess Elizabeth	H2	x			x
Purple Splendour	H2	xxxx	x		
Rainbow	H3	x			xx
Red Cap	H4				xx
Romany Chai	H3		x	x	xxx
Sappho	H2	xxx			x
Sir Chas. Lemon	H4	x			x
Souvenir of W. C. Slocock	H3	xxx	x	x	
Tally Ho	H5	x			xx
Temple Belle	H3	x		x	
Hon. Jean Marie de Montague	H3	x	xx	x	
Trilby	H2	xx			x
Unique	H3	xxx	x	x	
Unknown Warrior	H4	x		x	xx
Vanessa	H4		x		
Van Nes Sensation	H3	x			
Vulcan	H3	xx	x	x	x
White Swan	H4		x	x	x

Summary: The Hardiest Rhododendrons

On analysis the three articles dealing with rhododendron hybrids provide us with some very definite information as to which are the hardiest of the large number listed.

For comparison with the other two I have extracted from Mr. Edmund's list those with three or four stars in the "No Damage" column. Taking these and those mentioned by Mr. McClure and Mr. Witt as showing little or no damage, we find these seven varieties common to all three lists and therefore generally to be considered the toughest: "A. J. Ivens," "Bow Bells," "Britannia," "Goldsworth Yellow," "Purple Splendour," "Souv. of W. C. Slocock," "Unique."

Following them closely are nine others, found in two of the three lists: "Blue Peter," "Butterfly," "Fastuosum plenum," "Luscombei," "Mars," "Mrs. Charles Pearson," "Sappho," "Tribly," "Vulcan."

These sixteen varieties alone would provide a good range in season, flower color, and habit and size of plant, but by studying these lists carefully many others could safely be added to most gardens in the Puget Sound region, except those in the coldest locations. Nurserymen should take note.

Mr. Edmunds' list is also valuable since it clearly indicates the least hardy among the ninety-five hybrids covered.

We are particularly indebted to these authors and their collaborators, and to Mrs. Greig in dealing with rhododendron species, for this valuable local information.

B. O. M.

Free beauty is not bound
To one unmoved clime;
She visits every ground
And favours every time.

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Effects of Early Freeze at Royston, Vancouver Island

(Continued from Page 145)

'Ilam Violet'; defoliated and cut back.

Keiskei; s. and s. s. Triflorum; cut back.

Lacteum series, R. 155; cut back but recovered.

Lopsangianum; s. and s. s. Thomsonii; defoliated and cut back.

moupinense; s. Moupinense; cut to ground.

nitens; s. Saluenense; cut to ground.

oreotrephes; s. Triflorum, s. s. Oreotrephes; cut to ground.

radicans; s. Saluenense; cut to ground.

Sanguineum sub-series; s. Neriiflorum; cut to ground.

scyphocalyx; s. Neriiflorum, s. s. Sanguineum, sperabiloides; s. and s. s. Neriiflorum; Stewartianum; s. and s. s. Thomsonii; all defoliated.

trichostomum var. ledoides; s. Anthopogon; severely cut, most recovered.

trichostomum var. radinum; cut back.

villosum; s. Triflorum, s. s. Augustinii; defoliated.

D. Plants on the borderline of hardiness at Royston, damaged but recovered.

Falconeri series, R. 102; cut to ground.

euchaites x *strigillosum;* cut to ground.

megeratum; s. Boothii, s. s. Megeratum; cut to ground.

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(Continued from Page 137)

considerable research has been done on seaside planting and a few references are attached.

Bibliography

Seaside Planting—Jones Beach State Park; *Parks and Recreation,* p. 34, (October 1934).

W. J. Bean; *Trees and Shrubs of the British Isles,* vol. 1, p. 103, (1914).

Arnold Arboretum *Bulletin;* (Nov. 3, 1939).

Gardening Illustrated; (August 3, 1935).

A Garden by the Sea; *New Flora and Silva,* vol. IV, No. 1, 66-68, (October 1930).

E. H. Wilson; *More Aristocrats of the Garden,* p. 31-44, (1928).

Gardeners' Chronicle and Gardening Illustrated, (June 19, 1957).

Webber & Witt, Seaside Planting, *Gardeners' Chronicle of America,* (June, 1939).

E. W. Studley; Problems of Horticulture in Seaside Resorts, *Park Administration* (Great Britain), p. 382, (January 1957).

Webster A. D.; *Seaside Planting,* (Unwin, London, 1918).

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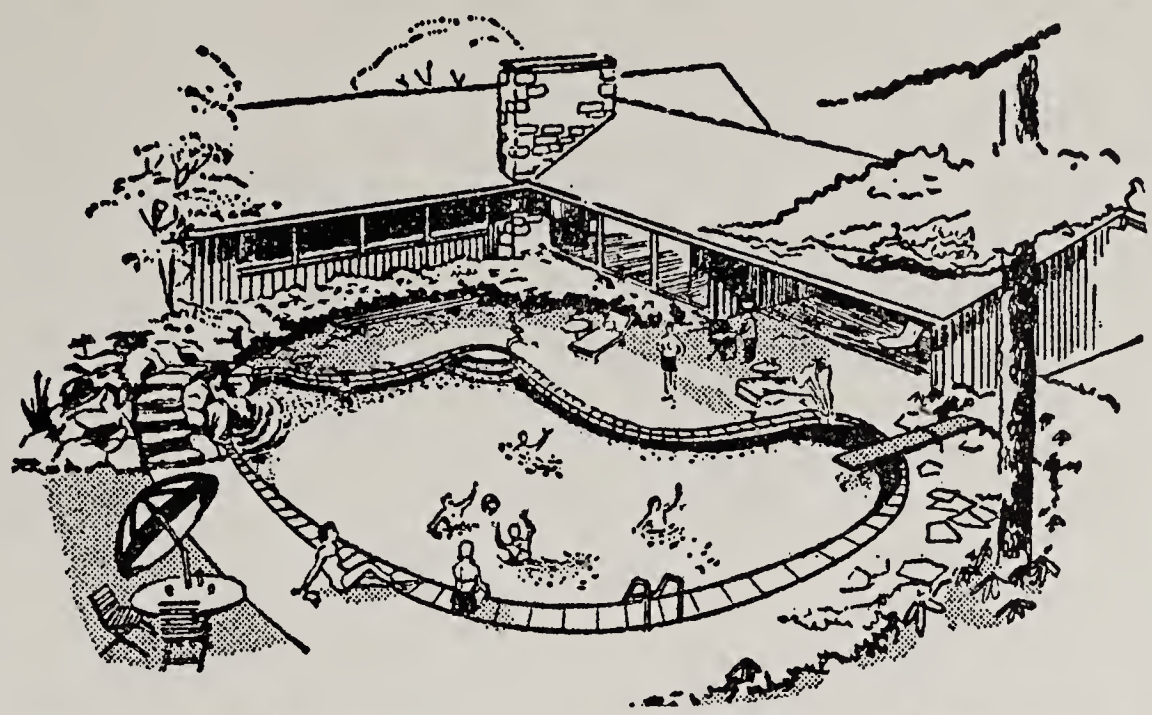

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